Class AE5

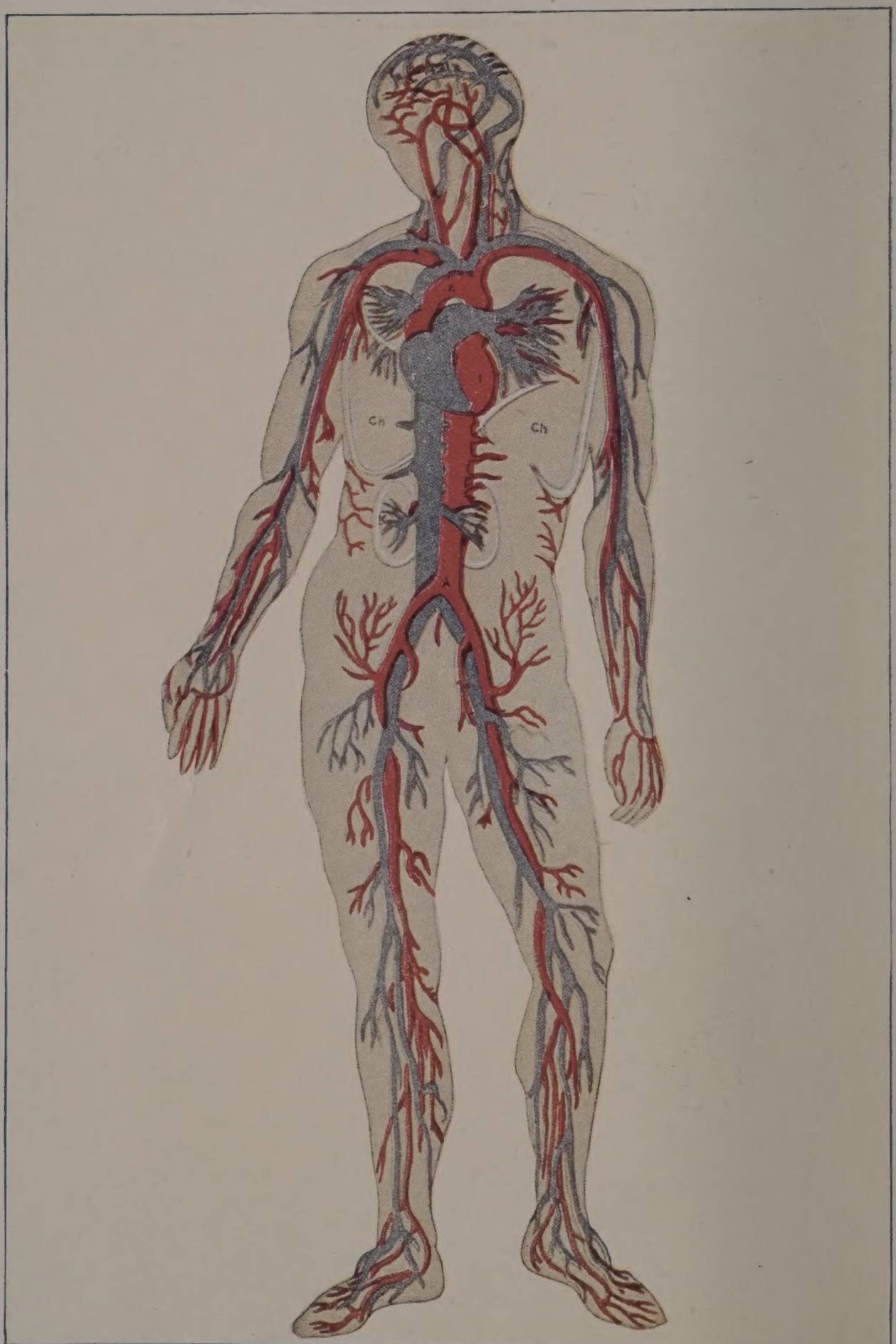
Book U47

Copyright No.

COPYRIGHT DEPOSIT.

BLOOD.—The General Distribution of the Blood Vessels.

Arteries are shown in red, the veins in blue.



H, the heart. l, left side. r, right side. Arising from the heart is the main artery, Aorta (A). The letter is put on the vessel at some distance from the heart, near where it gives off the branches (in red) for the head and arms, and at the point where it arches backwards and downwards to pass through the chest and the belly till at A, it gives off branches for the legs. Running alongside the arteries are represented in blue, veins. At K, is represented the position of the kidneys and their veins. L, represents veins of the lung. J, jugular vein. Ch, outlines of the chest.

THE UNITED EDITORS PERPETUAL ENCYCLOPEDIA

A LIBRARY OF UNIVERSAL KNOWLEDGE
COMBINED WITH AN
UNABRIDGED DICTIONARY
OF THE
ENGLISH LANGUAGE

MANAGING EDITOR
GEORGE EDWIN RINES
ASSISTED BY MORE THAN FIVE HUNDRED OF THE MOST EMINENT SCHOLARS AND SPECIALISTS

THIRTY VOLUMES
ILLUSTRATED

UNITED EDITORS ASSOCIATION
NEW YORK—CHICAGO
MDCCCCXI

AE5
.U47

COPYRIGHT, 1909
BY
THE UNITED EDITORS ASSOCIATION

COPYR.GHT, 1911
BY
THE_UNITED EDITORS ASSOCIATION

©CI.A297620
no.1

SCHEME OF SOUND SYMBOLS

FOR THE PRONUNCIATION OF WORDS.

Note.—(-) is the mark dividing words respelt phonetically into syllables; (′), the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
ā	...mate, fate, fail, aye	*māt, fāt, fāl, ā.*
ă	...mat, fat	*măt, făt.*
â	...far, calm, father	*fâr, kâm, fâ′thėr.*
ä	...care, fair	*cär, fär.*
aw	..fall, laud, law	*fawl, lawd, law.*
ē	...mete, meat, feet, free	*mēt, mēt, fēt, frē.*
ĕ	...met, bed	*mĕt, bĕd.*
ė	...her, stir, heard, cur	*hėr, stėr, hėrd, kėr.*
ī	...pine, ply, height	*pīn, plī, hīt.*
ĭ	...pin, nymph, ability	*pĭn, nĭmf, ă-bĭl′ĭ-tĭ.*
ō	...note, toll, soul	*nōt, tōl, sōl.*
ŏ	...not, plot	*nŏt, plŏt.*
ô	...move, smooth	*môv, smôth.*
ö	...Goethe (similar to *e* in her)	*gö′tėh.*
ow	..noun, bough, cow	*nown, bow, kow.*
oy	..boy, boil	*boy, boyl.*
ū	...pure, dew, few	*pūr, dū, fū.*
ŭ	...bud, come, tough	*bŭd, kŭm, tŭf.*
ú	...full, push, good	*fúl, púsh, gúd.*
ü	...French plume, Scotch guid	*plüm, güd.*
ch	...chair, match	*chär, măch.*
ċh	...German buch, Heidelberg, Scotch loch (guttural)	*bôċh, hī′dėl-bĕrċh, lŏċh.*
g	....game, go, gun	*gām, gō, gŭn.*
j	....judge, gem, gin	*jŭj, jĕm, jĭn.*
k	...king, cat, cot, cut	*kĭng, kăt, kŏt, kŭt.*
s	....sit, scene, cell, city, cypress	*sĭt, sēn, sĕl, sĭt′ĭ, sī′prĕs.*
sh	...shun, ambition	*shŭn, ăm-bĭsh′ŭn.*
th	...thing, breath	*thĭng, brĕth.*
th	...though, breathe	*thō, brēth.*
z	....zeal, maze, muse	*zēl, māz, mūz.*
zh	...azure, vision	*ăzh′ėr, vĭzh′ŭn.*

BLACK WATCH: appellation given to certain armed companies dressed in dark-colored tartans, employed to keep order in the Highlands of Scotland. Some Highlanders had been armed by government as early as 1725; but about 1729–30 the companies assumed a regular form, being six in number—three of 100 men each, and three of 70 men each. The six were stationed in different parts of the Highlands, acting independently of each other. The whole of the companies were formed into the 42d Regt. under the command of the Earl of Crawford, 1739. Retaining its original Highland character, the 42d Regt. became one of the most-distinguished corps in the British army. As it was embodied under the Earl of Crawford, a Lowlander, it was necessary to adopt an arbitrary pattern of tartan, which has ever since been known as the 42d or B. W. tartan. When in 1881 the numerical designations of the British foot-regiments were dropped, the former 42d and 73d regiments were made respectively first and second battalions of the 'B. W. (Royal Highlanders).' The regiment was practically annihilated in the Boer War (1901).

BLACK-WATER FEVER: see HEMOGLOBIMINA.

BLACK'WATER: river of Cork county, Ireland; rising in the w. of Kerry county; runs e. across Cork county and the w. part of Waterford county, in a carboniferous limestone basin, past Mill-street, Mallow, Fermoy, Lismore, and Cappoquin, and enters the sea at Youghal harbor. Mountains bound it on the s., and its chief feeders come from the n. It has a course of 100 m., and is the seventh in size of the Irish rivers. The scenery along its banks is highly beautiful and picturesque, with ruins, mansions, and woods. It is navigable for barges for the lower 15 m. of its course. It abounds in salmon.

BLACK'WATER: river prov. of Ulster, Ireland; rising on the confines of Tyrone and Fermanagh counties: runs first s.e., then n.w. through Tyrone; then between Tyrone, Monaghan, and Armagh, past Caledon and Charlemont, and falls into the s.w. corner of Lough Neagh.

There are in all five Irish rivers of this name.

BLACK'WELL, *blăk'wĕl*, ALEXANDER: b. Aberdeen, Scot., early in 18th c.; d. Sweden, 1748, Aug. 9: physician. He was son of the Rev. Thomas B., one of the ministers of Aberdeen and principal of Marischal College. He studied physics under Boerhaave at Leyden, where he took the degree of M.D. He was afterwards a printer in London, but becoming bankrupt, 1734, was supported in prison by his wife, who prepared and published a *Herbal* (2 vols. folio, 1737–39) with 500 cuts of plants, drawn, engraved, and colored by herself, her husband adding their Latin names, with a brief description of each. The work, patronized by the College of Physicians, had great success, and B. obtained his release. A work on Agriculture, published by him, falling under the notice of the king of Sweden, B. was invited to Stockholm, 1740, and received

apartments in the house of the prime minister, with a pension. Having cured the king of a dangerous illness, he was appointed one of the royal physicians; but while high in court favor, he was charged with conspiracy with Count Tessin against the king and govt., and after torture he was broken on the wheel, protesting his innocence.

BLACKWELL, Mrs. Antoinet Louisa (Brown), American woman suffragist and Unitarian minister: b. Henrietta, N. Y., 1825, May 20. A graduate of Oberlin (1847), she 'preached her own orders,' at first in Congregational churches, becoming at length a champion of woman's rights. She has written *Shadows of Our Social System* (1855); *The Island Neighbors* (1871), a novel of American life; *Sexes Throughout Nature* (1875); *Studies in General Science* (1869); *The Physical Basis of Immortality* (1876); *The Philosophy of Individuality* (1893); *Sea Drift or Tribute to the Ocean* (1903).

BLACK'WELL, Elizabeth, m.d.: b. Bristol, England, 1821, Feb. 3. Her father emigrated 1832, and for several years resided in New York, but settled 1838 in Cincinnati, where he died. Elizabeth studied medicine in Asheville, N. C., and Charleston, S. C., supporting herself by teaching. She made many unsuccessful attempts to enter medical schools, but was at last admitted to one at Geneva, N. Y., where she graduated with the degree m.d., 1849, Jan. She then went to Paris, and London, where she studied obstetrics. In 1851 she began practice in New York, and, with her sister Emily B., organized an infirmary for women and children in that city. She went to England 1859, and delivered lectures on the subject of medical education for women, but returned 1861, and busied herself in organizing medical relief for the sick and wounded in the army. In 1868 she became professor in a woman's medical college that she had assisted in organizing in London. She published *Laws of Life*, etc.

BLACKWELL'S ISLAND: in the East river, from opposite 50th to 84th sts., New York; $1\frac{3}{4}$ m. long. $\frac{1}{8}$ m. wide, comprising 120 acres. It was owned by the Blackwell family for a century or more, whence its name. It is occupied by public penal and charitable institutions. A new East-river bridge to connect the boroughs of Manhattan and Queens, begun 1901, July, has central piers on the island.

BLACKWELL, Lucy (Stone): 1818, Aug. 13—1893, Oct. 18; b. West Brookfield, Mass.: reform advocate. She graduated at Oberlin College in 1847, and immediately began her career as a lecturer in behalf of anti-slavery and woman suffrage. In 1855, she married Henry B. Blackwell, but by previous agreement retained her maiden name. She was editor of the *Woman's Journal*, of Boston. She lectured in all parts of the United States, continuing her labors until her death.

BLACKWELL, Thomas, Scottish writer: b. Aberdeen, 1701, Aug. 4; d. Edinburgh, 1757. After receiving the

rudiments of his education at the grammar-school of his native city, he entered Marischal College, where he took the degree of A.M. in 1718. Blackwell, having turned his attention to Greek, was honored in 1723, when only 22 years of age, with a Crown appointment to this chair. His *Inquiry into the Life and Writings of Homer* was published at London in 1737. A second edition of the work appeared in 1746, and shortly after *Proofs of the Inquiry into Homer's Life and Writings*. In 1748 he published anonymously *Letters Concerning Mythology*. In the course of the same year he was advanced to be principal of his college. In 1750 he opened a class for the instruction of the students in ancient history, geography, and chronology. In 1753 he published the first volume of *Memoirs of the Court of Augustus*. A second volume appeared in 1755, and a third, which was posthumous, and left unfinished by the author, was prepared for the press by John Mills, Esq., and published in 1764.

BLACKWOOD, *blăk'wûd*, Adam, Scottish writer: b. Dunfermline, 1539; d. 1613. He went to Paris, where, by the liberality of his youthful sovereign, Queen Mary, then residing at the Court of France, he was enabled to complete his studies, and to go through a course of civil law at the Univ. of Toulouse. He was patronized by James Beaton, the expatriated Archbishop of Glasgow, who recommended him to Queen Mary and her husband the dauphin, by whose influence he was chosen a member of the Parliament of Poitiers, and afterward appointed to be professor of civil law at that court. His first work was one entitled *De Vinculo Religionis et Imperii Libri Duo* (Paris 1575), to which a third book was added in 1612. His next work was entitled *Apologia pro Regibus*, and professed to be an answer to George Buchanan's work, *De Jure Regni apud Scotos*. He next published, in French, an account of the death of his benefactress, Queen Mary, under the title, *Martyre de Maria Stuart Reyne d'Escosse* (Antwerp, 8vo. 1588). In 1644, 30 years after his death, appeared his *Opera Omnia*, in one volume, edited by the learned Naudeus.

BLACKWOOD, William: 1776, Nov. 20—1834, Sep. 16; b. Edinburgh: publisher. After serving his apprenticeship to the bookselling business in his native city, and prosecuting his calling in Glasgow and London, he settled in Edinburgh as a bookseller—principally of old books—in 1804. In 1817, having become a publisher on his own account, he issued the first number of *Blackwood's Magazine*. The literary ability displayed in this periodical, much in advance of the monthly magazines then existing, gave it success from the start. Its remarkable popularity was sustained by the papers of John Wilson (q.v.) and J. G. Lockhart (q.v.), also of James Hogg (q.v.), and other writers, whom B. had the liberality and tact to attract to his standard. Overwhelming its political and literary opponents, now with the most farcical humor, and now with the bitterest sarcasm—sometimes with reckless injustice—

the Magazine secured for itself a prodigious reputation, particularly among the tories, of whose political creed it has always been a resolute adherent. Probably it cannot be said that *Blackwood's Magazine* has ever had any distinct editor. William B. himself, who added literary tastes and acquirements to his profession of a bookseller, was the chief manager of his Magazine, and conducted all the correspondence connected with it until his death. Under his sons, who succeeded him in the business, it not only sustained but increased its reputation; and under his grandson the places of its old contributors are still supplied by many of the most distinguished men of letters in the country. In the conduct of the Magazine, Professor Aytoun was understood to occupy, in relation to the publishers, a position somewhat analogous to that which Wilson had formerly held. The publishing business, which includes that of printing the works issued, has been greatly extended since the days of the founder of the house.

BLADDER, n. *blăd'dėr* [AS. *blædre;* Icel. *bladra*, a bubble, a blister: Ger. *blatter*, a pustule]: a thin sack or bag in animals, capable of distension, for containing particular fluids, such as the *urine* and the *gall*. BLAD'DERED, a. *-dėrd*, swelled like a bladder. BLAD'DERY, a. *-dėr'ĭ*, like a bladder. BLADDER-SENNA, the English name of *Colutea*, a genus belonging to the papilionaceous sub-order of the *Leguminosæ*. BLADDER-WORTS, aquatic plants so named from the utricules or bladders connected with the leaves; the genus of plants *Utric'ulārĭă*, ord. *Lentib'-ulārĭā'cĕæ*.

BLADDER (urinary): a bag formed of fibrous membrane externally, muscular fibres in the middle, and mucous membrane for an internal lining. The peritoneum covers its back. The shape of the B. is somewhat conical, the *apex* pointing upward; the anterior part of the *base* is constricted at the commencement of the urethra, called the *neck* of the bladder. On each side, rather below its middle, open the two ducts from the kidneys (the ureters); an imaginary line drawn between them, and from each end of this line others drawn to the neck of the bladder include an equilateral triangle. In this space, which is called the *trigone*, the mucous membrane is not thrown into folds, but is smooth and very sensitive, the slightest touch upon it giving rise to a desire for micturition. The habit of some children of wetting the bed when sleeping on their backs is supposed to be due to the urine accumulating in this part; the distressing pain of stone is also due to irritation of this part.

The B. is situated in the pelvis in adults, but much higher in the young. It is kept in position by four true or membranous ligaments, and false ligaments formed of folds of the peritoneum. The neck of the B. is surrounded by the prostate gland, and here the urethra (q.v.) begins. Like all cavities lined by mucous membrane, the B. is subject to catarrhal inflammation (Cystitis) which is accompanied by an increased secretion of mucus, render-

ing the urine turbid, by frequent and painful desire to pass water, and constitutional disturbance. The distressing symptoms may be relieved by hot fomentations together with opiates and urinary diluents, such as flaxseed tea; but by far the most important measure is to search for the exciting cause, and remove it if possible. Among the most frequent causes, are gonorrhea, with extension of the inflammation into the bladder, stricture of the urethra, hypertrophy of the prostate gland (q.v.), and calculus. The acute forms frequently pass into the chronic, and are then most intractable and obstinate of cure. If due to the extension of gonorrhea and stricture, no treatment of the bladder itself is of the slightest value unless the stricture is removed, either by dilatation or cutting, and the gonorrhea cured. In certain cases of enlargement of the prostate, and this is common in men past middle life, it is impossible to empty the bladder completely. The urine that remains behind, known as residual urine, decomposes, and excites an inflammation of the bladder walls, which secrete an amount of mucus. The urine is turbid, generally highly alkaline, offensive in odor, and very irritating to the inflamed bladder, and the patient is compelled to urinate very frequently, in some cases as often as 60 times in 24 hours. In consequence the patient becomes emaciated and enfeebled from loss of sleep and from pain. This condition may be met in one of two ways: Either (1) the urine must be drawn off regularly with a catheter specially constructed to pass behind the hypertrophied prostate, and the bladder irrigated with a bland, unirritating, antiseptic wash, such as a solution of boric acid in warm water—the patient being compelled for the remainder of his life to use a catheter; or (2) the patient must submit to the operation of prostatectomy or removal of that portion of the prostate that obstructs the flow of urine. The first of these methods of treatment is unsatisfactory, for it is almost impossible to keep the catheter always sterile, and if it is not its introduction only serves to prolong the inflammation and to increase the decomposition of the urine. If the inflammation of the B. be due to stone, removal of the stone is imperative. (See LITHOTRITY: LITHOTOMY.)

Irritable B. resembles the former disease, but is produced by various causes unaccompanied by inflammation. Some persons, from mere nervousness, are frequently troubled with a desire to pass water, and many in this condition never effectually empty the bladder, always leaving a portion, which keeps up the irritation. This condition frequently arises from the habit of retaining the urine so long as to overdistend and weaken the muscular walls of the B.; but it may be induced by general debility, the irritation of worms, cold, or an irritating state of the urine itself. The best treatment is tonics, and soothing the irritability with sedatives. When this irritability is nocturnal, it may be from the patient lying on the back, as explained above; it generally occures in delicate

children, and is more a habit than a disease. See in general, URINE. URINE, INCONTINENCE OF: RETENTION OF URINE.

Paralysis of the B. may be the result of accident, or disease of the nervous centres, or overdistention; in this condition the urine accumulates and dribbles away, and must be drawn off by the catheter (q.v.). This dribbling, or *incontinence*, must be carefully distinguished from irritable B., as it is in nearly every case the sign of a distended bladder. *Retention* of the urine may be caused by mechanical obstacles to its exit, by paralysis, or by an abscence of volitional power over the muscles. This last is termed *Hysterical* retention, and is common in young girls, in persons suffering from sea-sickness, from being in a strange place, an accident, such as a broken leg, etc. If the affection is not encouraged by an officious use of the catheter, the power generally soon returns. Any long-continued difficulty in passing water is generally followed by a thickening of the walls of the B. itself, or *Hypertrophy*. The mucous membrane may form pouches in these thickened walls, which is called *Sacculated* B., and cancer or other growths and tuberculosis may also attack this organ.

The B. is liable to be ruptured by accident from without as, for instance, by a blow or hurt from a saddle. If the B. is ruptured posteriorly, the accident is almost always fatal, though prompt operation may save life.

BLAD'DER CAMPION: see SILENE.

BLAD'DER GREEN: see BUCKTHORN.

BLAD'DER NUT (*Staphyle'a*): genus of plants of the order *Sapindaceæ*. These plants have usually opposite pinnate leaves, the leaflets of which, as well as the leaves themselves, have deciduous stipules. The sepals, petals, and stamens are equal (five) in number. Only about fourteen species are known, found in very different climates and scattered over the world. They are mostly small trees of rather elegant appearance. The seeds contain a considerable quantity of a fixed oil, which is slightly purgative. The common B. (*Staphylea pinnata*) is a native of the e. of Europe, and of temperate parts of Asia, which has been admitted into the British flora, but has in all probability been introduced as an ornamental tree. It is frequently planted in shrubberies, as is also *S. trifolia*, a N. American species with ternate leaves. The wood of both is firm and white, well suited for the purposes of the turner. The seeds may be eaten, but act as a mild aperient. The flower buds are pickled as capers. The name B. has reference to the curious inflated membranous capsule, and the hard bony *testa* of the seed. The name *Staphylea* is from the Greek *staphylē*, a bunch of grapes, and has reference to the racemed flowers.

BLAD'DER WORT (*Utricularia*): genus of plants of the nat. ord. *Lentibulariaceæ* (q.v.), containing a large number of species, the most of which are aquatic. They are found

in all parts of the world and are particularly abundant within the tropics. Many are natives of Australia, and about a dozen species are natives of the U. S. These plants are very interesting from the provision made for the expansion of their flowers above water, although the whole plant is ordinarily submerged. The roots, stems, and even leaves, are furnished with numerous little bladders or vesicles, which are filled with water till it is necessary that the plant should rise for the expansion of the flowers, when they become filled with air; and this again gives place to water after flowering is over, so that the seeds are ripened at the bottom. The bladders, at least of *U. vulgaris*, have an orifice closed by a very thin elastic valve opening inwards. Aquatic insects sometimes enter them, and are imprisoned. Some species are found in marshes, and in these the bladders are less effective and numerous than in the aquatic species; and in the few terrestrial species they are small, abortive and useless.

BLADE, n. *blād* [Icel. *blad*, leaf of a tree, blade of a sword: Ger. *blatt*., Dut. *blad*, a leaf, a plate: Gael. *blath*, a bloom or flower]: the long leaf or lamina of grass, or of a like plant; the cutting part of an instrument or weapon, as of a knife or sword; the broad part of an oar; the part of a tool that is broad or thin; a brisk, gay, bold fellow: V. to furnish with a blade. BLA′DING, imp. BLA′DED, pp.: ADJ. applied to crystals composed of long and narrow plates, like the blade of a knife; laminated. BLADE-BONE, the flat bone of the shoulder. BLADES, n. plu. *blādz*, the principal rafters or breaks of a roof.

BLADENSBURG, *blā′dĕnz-bĕrg*, Maryland, small town in Prince George co., on the east branch of the Potomac, about six miles east from Washington, with a population in 1900 of 463. At the bridge over the Potomac west of Bladensburg, the battle with the English which preceded the capture of Washington, took place toward the latter part of the war of 1812, Gen. Ross and Admiral Cockburn with about 5,000 men, appeared in Chesapeake Bay to attack Washington. The American forces fell back to Bladensburg and awaited the British. The Americans numbered about 7,000, but were scattered and untrained. On 1814, Aug. 24, the British advanced to the attack. The American artillery held them in check for a time, but the troops pushed forward. The Americans fled in wild disorder; the confusion spread and soon Gen. Winder, the American commander, gave orders for a general retreat. The American loss was 76 men; the British more than 500 killed and wounded. Bladensburg is famous in American history as the site of the duelling ground, where many famous duels growing out of quarrels in Washington were fought, as that in which Barron killed Decatur in 1820.

BLAEBERRY, n. *blā′bĕr-rĭ*, the name in *Scot.* for the BILBERRY (q.v.): see also WHORTLEBERRY.

BLAES, *blāz:* Scottish colliers' name for the shale of the

coal-measures, originating apparently from the 'blae' or bluish color sometimes noticed in the shale. The term is occasionally used by geologists.

BLAEU, *blâ'ĕh*, Blaeuw or Blauw, *blow* (Lat. *Cæsius*): name of a family of learned Dutch publishers who have rendered as important services to literature and art as Aldus, Giunti, Stephanus, or Elzevir, and whose activity spread itself over Europe for a century.

BLAEU, Willem: 1571–1638, Oct. 21; b. Alkmaar, Holland: mathematician, map-drawer, and publisher. He belonged to the school of Tycho Brahé, and published a terrestria' and a celestial globe, and several maps, excelling all that preceded. As a printer his work was good, though not rivalling Elzevir.

BLAEU, Johan: b. Amsterdam, about the beginning of the 17th c.; d. abt. 1680, son of Willem B. He was in the publishing business with his father. His *Atlas Major*, 11 vols., is a splendid work, full of archæological and geographical information with many curious plates and valuable maps. He published also a series of singularly rich topographical plates and views of towns. He left three sons, Johan, Willem, and Peter, of whom the first and third carried on the paternal business. Their Cicero's *Orationes* (1699) are still prized.

BLAGOVESHTCHENSK, *blâ-gô-vyĕsh'chĕnsk*, Russia, a town of eastern Siberia, capital of the province of the Amoor, and of the general government of the Amoor, on the river Amoor, where it receives the Zeya, near the Chinese town of Aigoon. Founded as a military post in 1856, it is now an important place, with secondary schools, theological seminary, etc. Pop. (1903) 37,841.

BLAIKIE, *blā'kĭ*, William, American athlete and writer on physical training: b. York, N. Y., 1843; d. there, 1904, Dec. 6. He became a lawyer in New York. He has written *How to Get Strong* (2d ed. 1880); *Sound Bodies for Our Boys and Girls* (1883).

BLAIKIE, William Garden, dd., ll.d.: Scottish Presb. clergyman and author: 1820, Feb. 5—1899, June 11; b. Aberdeen. Having graduated at Aberdeen Univ., he studied theol., was ordained to the ministry of the Church of Scotland, and was made pastor of the parish of Drumblade. At the disruption of that chh. 1843, B. was one of the 474 ministers who, headed by Dr. Thomas Chalmers (q.v.), organized the Free Church of Scotland (q.v.: see also Disruption). He became prof. of apologetics and pastoral theol. in New Coll., Edinburgh, 1868. He was one of the main promoters of what is now called the 'Pan-Presb. Alliance,' known first as the 'Alliance of Reformed Churches Holding the Presb. System'; and was editor of the *Free Church Magazine* in 1849–53; the *North British Review* in 1860–3; the *Sunday Magazine* in 1871–4; and the *Catholic Presbyterian* in 1879–83. His writings include *Bible History in Connection with General History*

(1859); *Bible Geography* (1860); *Glimpses of the Inner Life of David Livingstone* (1880); *Public Ministry and Pastoral Methods of Our Lord* (1883); *Leaders in Modern Philanthropy* (1884); etc.

BLAIN, n. *blān* [AS. *blegen;* Dut. *blein;* Dan. *blegne;* Icel. *blina;* prov. Sw. *blena,* a boil or pimple]: a sore; a blister; among *cattle,* a malignant carbuncle in the mouth, and especially on the tongue.

BLAINE, Ephraim, American soldier: d. Carlisle, Pa., 1808. He entered the army as a colonel, at the commencement of the Revolutionary War, and was subsequently made commissary-general. His services were gallant and patriotic. He was with Washington in many of the most trying scenes of the Revolution, and enjoyed the confidence of his chief to the fullest extent. During the 'dark winter' at Valley Forge, the preservation of the American army from starvation was in a great degree owing to the exertions and sacrifices of Col. Blaine.

BLAINE, *blān,* James Gillespie: statesman: b. W. Brownsville, Pa., 1830, Jan. 21—d. 1893, Jan. 27. He received preparatory education at home and at school in Lancaster, O., and graduated at Washington and Jefferson College, in his native co., 1847. As a student he had a marked taste for historical study, and excelled his fellow-students in literature and mathematics. In 1850 he removed to Ky., and was appointed teacher of mathematics in Western Military Institute, Blue Lick Springs. Two years later he resigned to accept an appointment as instructor in the Pennsylvania Institution for the Blind, Philadelphia, and during the few months he held this office he began studying law and contributing articles to the *Philadelphia Inquirer.* In 1853 he removed to Augusta, Me., became editor of the *Kennebec Journal* in that city, and subsequently purchased a half interest in the paper. He contributed largely to the formation of the republican party, and was a delegate to its first national convention 1856. By this time he had achieved wide repute as a political writer and platform speaker. The facility with which he massed facts, figures, and historical illustrations, the fluency of his speech, and magnetism of his personal presence, combined to make him at that early age a leader among men. In 1858 he was elected a member of the Me. legislature, and served by continuous annual re-elections till 1863, and was speaker during the two last terms. In 1862, Sep., he was elected member of congress from the third Me. district as a republican, and was re-elected for six successive terms, thus serving continuously 14 years. After the election of Speaker Colfax as vice-pres. 1868, B. was chosen to succeed him in the house, and was its speaker from 1869 till 1875, when the democratic majority elected Michael C. Kerr speaker. In 1876, July, B. was appointed by the gov. of Me. a member of the U. S. senate to fill the vacancy caused by the appointment of Senator Lot Morrill as sec. of the U. S. treasury; and at the ensu-

ing session of the legislature was elected for the full senatorial term, expiring 1883, Mar. 4. A month after the election of Gen. James A. Garfield to the presidency, he urged B. with all the warmth of long personal and political friendship to enter his cabinet as sec. of state. The acceptance of this office caused B.'s resignation as U. S. senator, and closed an uninterrupted service in congress of 18 years. During this period he was an indefatigable worker, both in the committee room and on the floor of the house and senate. In the 38th congress he was a member of the house committee on post-offices and post-roads; 39th, on milit. affairs, war debts of the loyal states (chairman), and the special committee on the death of Pres. Lincoln; 40th, on appropriations and on rules; 41st, 42d, and 43d, as speaker on select committee on rules; 44th, senate committees on appropriations and on naval affairs; 45th, on rules (chairman), naval affairs, and select committee on the levees of the Mississippi river; and 46th, on appropriations, naval affairs, and rules. During his congressional career he was conspicuously instrumental in securing the introduction of the present postal car system; earnestly supported all measures for the uncompromising prosecution of the war; took a foremost part in legislation for the reconstruction of the states previously in rebellion; forced the embodiment, in the XIVth amendment to the federal constitution, of his theory that representatives and direct taxes should be apportioned among the states according to their respective numbers, to be ascertained by a special census; drew up and championed till adopted the 'Blaine amendment' to the reconstruction bill, reported by Thaddeus Stevens 1867, Feb. 6, providing that any of the so-called Confederate states should be entitled to representation and be freed from the provisions for milit. govt. when they respectively should assent to the XIVth constitutional amendment and establish impartial suffrage, and have their action approved by congress; and led in discussion on the English doctrine of perpetual allegiance, till the treaty of 1870 gained from Great Britain the acceptance of the American principle of equal protection for adopted and native citizens. His career in the house, as much from his own temperament as from current circumstances, was an extremely excited one. In its closing months, actions of personal antagonism were taken that caused him much mental suffering. He was accused of having received $64,000 from the Union Pacific railroad company for services rendered; and when he produced evidences to prove the falsity of the charge, other accusations were alleged, which he similarly met. 1876, May, 2, a resolution was adopted by the house providing for the investigation of an alleged purchase of certain railroad bonds by the Union Pacific company. B. and his friends believed that he was the real object of the proposed investigation, and within a few days he learned that his letters in a long business correspondence with Warren Fisher, Jr.,

of Boston, had been collected and indexed by James Mulligan, and were to be used against him in the investigation. He succeeded in gaining control of the letters, and June 5 from his desk in the house exhibited the letters and invited the confidence of his countrymen while he read them, thus producing a most dramatic scene.

The beginning of his senatorial career was nearly simultaneous with the opening of the republican national convention. His admirers presented his name for the nomination for pres. of the United States, and clung to him with such tenacity that on the 7th ballot he received 351 votes, lacking only 28 of a majority, the nomination going to Gov. Rutherford B. Hayes (q.v.), of O. After taking his seat in the senate, he opposed the Electoral Commission Bill, claiming that congress did not possess the power that it proposed to confer; opposed the Bland Silver Bill; favored a bi-metallic currency; and urged the development and protection of American shipping. In the republican national convention 1880, when Gen. Grant's name was presented for a 3d term, B. received 284 votes to 304 for Grant on the 1st ballot, Gen. James A. Garfield (q.v.) ultimately receiving the nomination. His tenure of the office of sec. of state was limited to less than a year by the assassination of the pres., and he was succeeded by Frederick T. Frelinghuysen, who served to the close of Pres. Arthur's administration. While sec. of state, and with the approval of Pres. Garfield, he issued invitations to a Pan-American conference to be held in Washington; but these invitations were recalled by Sec. Frelinghuysen by authority of Pres. Arthur. After the death of Pres. Garfield, B. was honored with a joint invitation by congress to deliver a memorial address, which he did in the hall of the representatives 1882, Feb. 27. In Dec. following the resignation of his office was accepted. In the leisure of his retirement from public life, he applied himself to the compilation of a historical work, *Twenty Years of Congress*, issuing the 1st vol. 1884 and the 2d 1886. At the republican national convention 1884, he received 334½ votes on the 1st ballot, and on the 4th gained the presidential nomination by a vote of 541 out of a total of 813. A bitter canvass followed, in which the Mulligan letters played a large part; and there was a strong defection of prominent members of the republican party from its candidate to Grover Cleveland (q.v.), the democratic nominee. There was a loss also of many thousand republican voters who supported the prohibition candidate for president. However, the probability of B.'s success was strong till an unfortunate expression by one of the speakers at a reception tendered B. in New York a few days before the election, turned from his support a multitude of Rom. Cath. Irish who had been counted as favoring him. By a margin so narrow that a few hundred votes decided the result, Cleveland, who had been chosen gov. of N. Y. by a majority of over 192,000, received the

electoral vote of that state, and became president. Subsequently B. was active in the Me. state elections, and 1887 started on a lengthy European trip. During his absence his friends continued to consider him as an available candidate for the presidential nomination 1888, till Feb. of that year, when the chairman of the republican national committee published a letter from B. in which he declared himself no longer a candidate for the nomination. On the election of Benjamin Harrison (q.v.) 1889, B. was again tendered and accepted the office of sec. of state. One of his earliest acts was to reissue his invitations to the Mexican and the S. and Central American govts. for a joint conference in Washington. The delegates began their business session 1889, Oct. 2, electing B. presiding officer. They adjourned *sine die* 1890, Apr. 19. During the last two years of his life, B. suffered—always with great fortitude—from chronic ailments. His last important official act was procuring the insertion in the McKinley tariff bill of clauses arranging for reciprocal commercial relations with foreign countries under specific stipulations. He resigned from the cabinet 1892, June 4, and at the national republican convention at Minneapolis, June 7–11, was named as a presidential candidate, though in the autumn of 1891 he had in a published letter distinctly withdrawn his name from the candidacy; but the nomination went to Mr. Harrison.—B. died at Washington. Few public men in any land have drawn forth warmer personal esteem and love, or fiercer and more persistent political attack. His manners had a rare charm; his oratory was impressive and magnetic like his personality.—His *Twenty Years in Congress* is an elaborate and brilliant historical work.

BLAINVILLE, *blăng-vēl′*, Henri Marie Ducrotay de: 1778, Sep. 12—1850, May 1; b. Arques, near Dieppe: distinguished French zoologist and anatomist. He studied medicine and the physical sciences in Paris, taking his degree in 1808. In 1812 he was appointed assist. prof. of comp. zoology, anat., and physiol. in the Univ. of Paris; and 1832, successor of Cuvier in the chair of compar. anat. in the Museum of Nat. Hist. Besides small treatises, he published many large and valuable works; such as *Cours de Physiologie, Générale et Comparée* (1833); *Ostéographie* (1839–49), *Manuel de Malacologie et de Conchyliologie* (1825–27); *Manuel d' Actinologie et de Zoophytologie* (1834–37); *L'Organisation des Animaux, ou Principes d'Anatomie Comparée* (1822); *Sur les Principes de la Zooclassie* (1847); and above all, the gigantic but unhappily unfinished work entitled *Ostéographie ou Description Iconographique Comparée du Squelette et du Système Dentaire des Cinq Classes d'Animaux Vertébrés, Récents et Fossiles* (1839–50).

BLAIR, *blär*, or Port Blair: principal British settlement of convicts on the Andaman Islands in the Bay of Bengal, named after Lieutenant Blair, R.N. who selected the place in 1789. It is off the s.e. coast of South Andaman Island, lat. 11° 42′ n. and long. 93° e.; has one of the best

harbors of Asia, and is a naval rendezvous for military operations in the east.

BLAIR, ANDREW ALEXANDER, American chemist: b. Kentucky, 1848, Sept. 20. He graduated at the United States Naval Academy, 1866; was chief chemist to the United States Commission to test iron, steel, and other metals, 1875–8, and to the United States Geological Survey and 10th census, 1879–81. Since then he has been engaged in general practice. Besides reports to the government and contributions to scientific journals he has published *The Chemical Analysis of Iron: Complete Account of All the Best-Known Methods for the Analysis of Iron, Steel,* etc. (Phila. 1888).

BLAIR, ANDREW GEORGE, Canadian statesman: b. Fredericton, N. B., 1844, March 7; d. 1907, Jan. 25. He was educated at the Collegiate School Fredericton; was called to the bar 1866; was elected from York to the New Brunswick Assembly 1878; was chosen leader of the Opposition 1879; was premier of the province 1883–96; then became Minister of Railways and Canals in the Dominion Cabinet but resigned in July, 1903; in February, 1904, became chairman of the newly created Railway Commission and resigned in October of that year.

BLAIR, FRANCIS PRESTON, Sr.: 1791–1876: statesman: b. Abingdon, Va., educated at Transylvania Univ., Ky., took a law course, but never practised. He had been a supporter of Clay, but in 1828 became a Jackson democrat. In 1829, at the suggestion of Pres. Jackson, he came to Washington and commenced the publication of the *Globe,* the acknowledged organ of the democratic party until 1845, when he was removed from its management by Pres. Polk, who afterwards offered him the embassy to Spain, which he declined. After the Missouri compromise was repealed, 1854, he left the democratic party, and in 1856 was president of the national republican convention at Pittsburgh, drafted its platform, and after refusing to allow the use of his own name as a candidate, gave his influence in favor of Col. Fremont for the presidency. After the death of Lincoln, B., dissatisfied with the general policy of the republicans, again joined the democratic party.

BLAIR, FRANCIS PRESTON, Jr.: 1821–75: son of Francis P. B., Sr.; b. Lexington, Ky. A graduate of Princeton College, he read law in Washington, became a member of the bar in Kentucky, 1843, and began practice in Missouri. For his health he accompanied some trappers (1845) to the Rocky Mountains; soon afterwards he enlisted and served as private in the war with Mexico. In 1848, he became a free-soil democrat, was editor for some time of the *Missouri Democrat,* and from 1852 was during four years a member of the legislature of Missouri. In 1856, he joined the republican party, and was three times elected as its representative in congress. It was largely through his foresight and promptness that Missouri and Kentucky

were save to the union. At the beginning of the war against secession he entered the army as colonel, became brig. gen., 1861, and maj.gen., 1862, Nov. 29. He commanded at Vicksburg, and in the battles of Lookout Mountain and Missionary Ridge, and accompanied Sherman in his famous 'march to the sea.' In 1868, he was the democratic candidate for vice-president; 1871–73, U. S. senator from Missouri. He wrote *The Life and Services of Gen. William O. Butler* (1848).

BLAIR, Henry William, American legislator: b. Campton, N. H., 1834, Dec. 6. He received an academic education; was admitted to the bar in 1859; served through the Civil war, becoming lieut. col. of the 15th New Hampshire Volunteers, and was twice wounded. After serving in both branches of the State legislature he was a member of Congress (1875–9 and 1893–5), and United States Senator (1879–91). He is the author of what was known as the 'Blair Common School Bill," designed to distribute a certain amount of Federal money for educational purposes among the various States in proportion to the number of illiterates. He was a strong opponent of Chinese immigration, and, when he was appointed and confirmed United States minister to China, that government objected to receiving him. He has been an active worker in the cause of temperance and other reforms. He has written *The Temperance Movement or The Conflict of Man with Alcohol; The Future of the Temperance Reform* (1895); etc.

BLAIR, Hugh: 1718, Apr. 7—1800, Dec. 27: b. Edinburgh: Scotch clergyman and man of letters. He entered the university of his native city, 1730, and while a student wrote an *Essay on the Beautiful.* In 1741, Oct., B. was licensed as a preacher of the Established Church; and after occupying successively the churches of Colessie in Fifeshire, Canongate Church in Edinburgh, and Lady Yester's, he was promoted, 1758, to the highest position attainable by a Scotch clergyman—one of the charges of the High Church, Edinburgh. In 1759, B. commenced a series of lectures on *Composition* to classes in the university; and three years afterwards, a new chair of rhetoric and belles-lettres, with a salary of £70 a year, being created by the crown, B. was made professor. He held this appointment until 1783, when he resigned; and in the same year published his *Lectures,* which obtained a reputation far beyond their merits, and one that time has not sanctioned. His first volume of *Sermons* appeared 1777 with the approval of Dr. Johnson, who had read them, and they were very successful. George III. showed his appreciation of them by bestowing on B., 1780, a pension of £200 a year. B. also published three other volumes of *Sermons,* and prepared a fourth, printed after his death. They were all as successful as the first volume. Opinion about their merits has much changed since the date of their publication; they are now considered as moral

essays rather than sermons. B.'s critical acumen was not great; he believed in the authenticity of Ossian's poems, which he strenuously defended.

BLAIR, JAMES: 1656–1743: a divine and educator; b. in Scotland, where he was educated and became a clergyman of the Episc. Church. In 1685 he was sent as missionary to Virginia. Perceiving the need of a seminary, he raised by subscription a fund of £2,500, obtained a charter in 1692, and by indefatigable efforts succeeded in founding at Williamsburg, 1693, William and Mary College, of which he was the first president, though he did not officiate in a formal manner until 1729. This institution was not successful at first, as the rich planters preferred to have their sons educated in England. He published *Our Saviour's Divine Sermon on the Mount Explained and Recommended in divers Sermons and Discourses* (1722).

BLAIR, JOHN, Scotch chronologist and geographer: d. 1782, June 24. He went to London about the middle of the 18th century. In 1754 the publication of a work in folio, entitled *The Chronology and History of the World from the Creation to* 1753 A.D., gained him great reputation. He dedicated his work to Lord Chancellor Hardwicke, and in 1757 was appointed chaplain to the Princess Dowager of Wales, and mathematical tutor to the Duke of York, whom he accompanied, in 1763, on a tour to the continent, having already received several ecclesiastical preferments. On his return to England he published, in 1768, a new edition of his *Chronological Tables*, with 14 maps of ancient and modern geography annexed.

BLAIR, JOHN INSLEY, American philanthropist: b. Belvidere, N. J., 1802, Aug. 22; d. 1899, Dec. 2. In early life he was a merchant and banker; subsequently becoming the individual owner of more miles of railroad property than any other man in the world. He acquired a very large fortune; loaned the Federal government more than $1,000,000 in the early part of the Civil War; built and endowed at a cost of more than $600,000 the Presbyterian Academy in Blairstown, N. J.; rebuilt Grinnell College, Iowa; erected Blair Hall and made other gifts to Princeton Univ.; was equally liberal to Lafayette College; and had erected more than 100 churches in different parts of the West, besides laying out many towns and villages on the lines of his numerous railroads.

BLAIR, MONTGOMERY: 1813–83; statesman: son of Francis P. B., Sr.; b. Franklin co., Ky. He graduated at West Point, 1835, served in the Seminole war, then studied law, and was admitted to the bar, 1839. In Missouri, where he began practice, he received the appointment of U. S. dist. attorney, was elected mayor of St. Louis, 1842, and served as judge of the court of common pleas, 1843–49. He resigned and removed to Maryland three years afterwards. He was U. S. solicitor, 1855–58; and was removed by Pres. Buchanan, having, like his father and brother, left the democratic party after the repeal of

the Missouri compromise. As postmaster-gen. under Lincoln, he introduced postal railroad cars, the money-order system, and free delivery in cities. He resigned, 1864, and returned to the democratic party, whither he was soon followed by his father and younger brother.

BLAIR, ROBERT: 1699–1746; b. Edinburgh, where his father was a clergyman. After completing his education for the ministry, and travelling on the continent, he was ordained, 1731, minister of Athelstaneford, Haddingtonshire, where he continued till his death. He was an accomplished and thoughtful man, gave considerable attention to natural science, particularly botany, and corresponded on friendly terms with several eminent men, among others Watts and Doddbridge. To them he submitted the MS. of his poem *The Grave*, which he had written before his ordination. Watts offered it to two publishers, who thought it too heavy for the times, and it remained several years unprinted. It afterwards attained an honorable place in the esteem of those appreciating a forcible, though somewhat gloomy, thought and imagery, applied to a profoundly suggestive and serious theme. It found a congenial illustrator in William Blake (q.v.). B. was succeeded in his ministerial charge by the author of *Douglas*. His son, Robert B., of Avontoun, became lord president of the court of session.

BLAIR-GOWRIE, *-gow'rĭ:* village in Perthshire, very picturesquely situated on the e. side of a range of hills, on the right bank of the Ericht, 16 m. n.n.e. of Perth. It consists chiefly of one winding street. It has flax-spinning and weaving factories, driven by the Ericht. Pure white marble is found in the vicinity. There is a branch railway from Cuper-Angus. Pop. (1881) 4,537; (1891) 3,714.

BLAKE, *blāk*, EDWARD: Canadian statesman: b. Adelaide, Ont., Canada, 1833, Oct. 13; son of William Hume B., jurist (d. 1870). Having graduated at University Coll., Toronto, 1857, he was admitted to the bar 1859, and soon was a distinguished chancery practitioner. Elected, 1867, both to the Ont. assembly and to the dominion parliament, he was from the first a leader in the opposition (liberal) party; was premier of Ontario 1872; successively minister of justice and pres. of the council in the Mackenzie administration 1873–78, and declined the dominion chief-justiceship; both he (1877) and his father (1853) declined knighthood. He was again in the dominion parliament and leader there 1882–89, when he retired from Canadian political life. The Irish constituency of South Longford chose him its representative in the British parliament 1892; his high character, learning, eloquence, experience in public affairs, and his sympathy with the Irish people, make him a valuable auxiliary in the struggle for home rule.

BLAKE, ELI WHITNEY, inventor: 1795, Jan. 27—1886, Aug. 18: b. Westborough, Mass. After graduating at Yale 1816, he began the stu ly of law, but soon left it for

employment in his uncle Eli Whitney's gun-factory, Whitneyville, where he invented many improvements in machinery and processes. On Whitney's death 1825, B. associated with himself his bro. Philos B., and another bro., John A. B., 1836. B. Bros. then opened at Westville, Conn., an establishment for manufacturing locks, hinges, latches, etc., and soon commanded the American market for such wares. B.'s capital invention, the stonebreaker, dates from 1857; it is now in use throughout the civilized world. B. was founder of the Conn. Acad. of Sciences.

BLAKE, Francis, American inventor: b. Needham, Mass., 1850, Dec. 25. He served for 13 years on the United States Coast Survey, part of the time engaged in field work and its reduction to determine differences of longitude between the observatories at Greenwich, Paris, Cambridge, and Washington. Having devoted himself to the study of experimental physics, in 1878 he invented the famous Blake transmitter, which is the telephonic transmitter now most widely used throughout the world. He has also patented other electrical devices.

BLAKE, George A. H.: military officer: 1812, Sep.—1884, Oct. 27. He began his milit. career as lieut. 2nd dragoons 1836, June 11; was promoted capt. 1839, Dec., and saw service in the Seminole war 1841. He was engaged in the Mexican war, was brevetted major, appointed maj. 1st dragoons 1850, July, and fought against the Apaches and Navajos. In 1861, May, he was promoted lieut.col. 1st U. S. cav., and col. 1862, Feb. 15; and distinguished himself in several engagements, particularly at Gettysburg, for which conduct he was brevetted brig.gen. 1865, Mar. 13. After the war he commanded at Fort Vancouver, and was retired 1870, Dec. 15.

BLAKE, George Smith: naval officer: 1803–1871, June 24; b. Worcester, Mass. He entered the U. S. navy as midshipman, 1818 Jan. 1; was promoted lieut. 1827, Mar. 31; commander 1847; capt. 1855. He was supt. of the naval acad. at Annapolis, 1858–65; appointed commodore 1862.

BLAKE, Homer Crane: naval officer: 1822, Feb. 1—1880, Jan. 21; b. Cleveland, O. He entered the U. S. naval service as midshipman 1840, and was made passed midshipman 1846; promoted lieut. 1855; lieut. commander 1862. He commanded the *Hatteras*, 1863, July 11, when she surrendered to the more powerful rebel cruiser *Alabama*, which sank her. B. commanded the *Utah* 1864, was promoted commander 1866, capt. 1871, commodore 1880.

BLAKE, John Laurie, American clergyman and author: b. Northwood, N. H., 1788, Dec. 21; d. Orange, N. J., 1867, July 6. He was educated at Phillips Exeter Academy and at Brown University. He first entered the Congregational ministry, but in a short time became an Episcopalian and was ordained in that Church. He settled in Pawtucket, and later in Hopkinton, N. H., and in 1822 removed to Boston. He continued to teach in

this school till 1830, then devoted himself to literary work. While a teacher he published several text-books, prepared for his own classes, and was editor of the 'Gospel Advocate.' His greatest work, a *Biographical Dictionary*, was first published in 1835.

BLAKE, JOSEPH: colonist: 1620–1700; b. England; son of an English merchant, and bro. of the celebrated admiral Robert B. from whom he inherited a large fortune, much of which he employed in colonizing in the Carolinas. He was an earnest Protestant, and established, 1683, in Charleston, S. C., a considerable number of the best class of emigrants from Somersetshire, England, which led to the extensive settlement of North of Ireland and Prot. English people in that region.

BLAKE, LILLIE (DEVEREUX) (UMSTED): woman's rights agitator: b. Raleigh, N. C., 1835, Aug. 12. She is a descendant of Jonathan Edwards. After preparing at a seminary in New Haven, she took the Yale college curriculum with private tutors. In 1855 she married Frank G. Q. Umsted, lawyer of Philadelphia, who died 1859, leaving her with two children. In 1866 she married Grenfill Blake of New York, and removed thither. In 1869 she began to interest herself in reforms relative to women, particularly as to the right to vote; and became widely known as an able and enthusiastic lecturer and writer on these subjects. She was instrumental in the passage of the N. Y. law giving women in that state the right to vote on school questions; she led in the demand for the admission of women to Columbia coll.; she secured the appointment of police matrons. Advocating her cause Mrs. B. addressed committees of both houses of congress, and of several state legislatures, and spoke before large audiences in many states. As a speaker she is graceful, dignified, earnest, and impressive. She was pres. of the N. Y. State Woman suffrage assoc. 1879–90, and afterward of the New York City Woman suffrage league. She wrote several novels, notably *Fettered for Life* (1873); and her vigorous lectures in 1883 in reply to the Lenten discourses on Women by Morgan Dix, D.D., published under the title *Woman's Place To-day*, had great circulation. She published *A Daring Experiment*, vol. of short stories (1898). Since 1900 she has been president of the Civic and Equality Union.

BLAKE, ROBERT: 1598–1657; b. Bridgewater, Somersetshire, Eng.: celebrated admiral, who, more than any other, contributed to render England mistress of the sea. He was the son of a merchant. An ardent republican, and a man of blunt, straightforward manners, singularly devoid of fear, and of inflexible character, he was much respected by Cromwell, with whom, however, he had no great intimacy. When the civil war broke out, he raised a troop in Somersetshire, and took part in all important actions against the royalists of the western counties. In 1644, he surprised Taunton, of which place he was made governor, and in that capacity gave proof of military skill.

In 1649, in conjunction with two other officers of equal rank, he was appointed General of the Sea, the two services at that time not being distinct, as they are now. This was B's true sphere, and in it he soon showed transcendent ability. After destroying, with the exception of two vessels, the squadron of Prince Rupert, which had sought safety in the Tagus, 1651, B. forced the royalists to surrender Guernsey, Jersey, and the Scilly Isles. In 1652, March, he was made sole admiral of the fleet for nine months, and during this year he fought four engagements with Dutch fleets under Tromp, Ruyter, and De Witt. In the first, May 19, the Dutch retreated under cover of darkness, with the loss of one man-of-war captured, and another sunk. In the next engagement, a squadron of 12 ships, sent to protect the herring-vessels from the attacks of B., were captured; and in the third, Sep. 28, three Dutch vessels were destroyed and the rear-admiral taken. Nov. 29, a fleet of 80 vessels under the command of Van Tromp, encountered B. with only 40, off the Goodwin Sands. The Englishman scorned to fly even from odds so overwhelming, and the result of the action was the loss of six of his ships—two captured, and four destroyed; the rest, in a shattered condition, sought safety in the Thames. Van Tromp now committed that foolish act of bravado with which his name is associated: he tied a broom to the mast-head of his vessel, and sailed through the Channel, intimating that he had swept English vessels out of it. But, 1653, Feb., the indomitable B. was at sea again with 80 ships, and falling in with Van Tromp with about an equal force, he at once attacked him, and after a three days' running-fight, the Dutchman was fain to seek shelter in the shallow waters of Calais—where the greater draught of the English ships did not admit of their following—with a loss of 11 men-of-war, and 30 of a fleet of merchantmen he had in convoy. The English lost only one ship. On June 3, 4, B. and his coadjutors, Deane and Monk, won another victory over Van Tromp, but ill-health prevented B. from taking part in the engagement of July 29, which finally shattered the naval supremacy of Holland. In 1654, B. was appointed by Cromwell to command an English fleet in the Mediterranean, where he soon made the British flag respected by Dutch, Spanish, and French alike. The dey of Tunis refused to do it reverence. B. attacked his capital, burned the Turkish fleet of nine ships which lay before it, accomplished a landing, and with a body of about 1,000 men annihilated an army of 3,000 Turks. He next sailed to Algiers and Tripoli, landed, and set free all the English who were detained as slaves. He concluded alliances highly favorable to England with Venice and Tuscany. In 1657, he defeated the Spaniards at Santa Cruz. This was perhaps one of the most daring actions in B.'s memorable career. With a wind blowing right into the bay—which was very strongly defended—B. dashed in and attacked and destroyed the Spanish galleons and shipping in the harbor, and, the wind fortunately changing, sailed out again with a loss of only one ship and

200 men. The Spanish loss in men and property was immense, and the terror the action inspired insured increased respect to the English flag. His health now failed; he returned to England, and died as his ship entered the harbor of Plymouth. Cromwell honored his memory by a solemn funeral procession, and caused him to be interred in Westminster Abbey. His skill and courage were equalled only by his disinterested patriotism, sterling honesty, and love of justice; he not only gained a decided superiority over England's mightiest naval opponent, but, by the bold tactics that he introduced, infused that spirit of enterprise which has ever since distinguished the British navy.

BLAKE, WILLIAM: 1757, Nov. 28—1827, Aug. 12; b. London: engraver and poet. In 1789, he published *Songs of Innocence and of Experience, showing the Two Contrary States of the Human Soul*, with about 60 etchings, remarkable for their peculiar and original manner. The poems were equally singular, but many of them showed true pathos. Some marginal designs for Young's *Night Thoughts*, executed by B., were greatly admired by Flaxman. B. lived in the full belief that he held converse with the spirits of the departed great—among others, with those of Moses, Homer, Virgil, Dante, and Milton. He published numerous etchings, chiefly of religious and cognate subjects, among the best of which are his *Illustrations of the Book of Job*, and the illustrations of Blair's *Grave*. In 1808 he sent to the Royal Academy the pictures *Christ in the Sepulchre Guarded by Angels*, and *Jacob's Dream*, the last pictures he exhibited there. From 1813 till his death, he had a staunch friend and patron in the painter John Linnell. It was about this time that he executed the series of pencil drawings known as *Spiritual Portriats*. The highly prized wood-cuts to Thornton's *Virgil* were executed in 1820, and in 1825 he produced for Linnell his wonderful *Inventions to the Book of Job*, which, containing 22 engravings, 21 original designs in colors, with the original colored drawings by the artist (the property of the Earl of Crewe), sold in London, in 1903, for $28,000. He also executed a series of engravings and designs from the *Divina Commedia*. At the sale just mentioned 12 drawings in colors for *L'Allegro* and *Il Penseroso* brought $9,800, and the original colored issue of *America, a Prophecy*, sold for $1,475. Among Blake's other writings are: *Poetical Sketches* (1783); *Gates of Paradise* (1793); *Prophetic Books*, sadly incoherent, but with splendid designs (1793–1804).

He died in poverty and obscurity, with the conviction that he was a martyr to poetic art. Charles Lamb regarded him as 'one of the most extraordinary persons of the age;' and A. C. Swinburne said of him that he was 'the single Englishman of supreme and simple poetic genius of his time.' The only complete edition of his works is that of E. J. Ellis and W. B. Yates (3 vols. 1893). See *Life of B.*, by Alex. Gilchrist (1863); *William B.*, by

Swinburne (1868); and *Poetical Works*, edited by W. M. Rossetti (1874).

BLAKE, William Phipps: American mineralogist: b. New York, 1826, June 1. Graduating at the Sheffield Scientific School in 1852, he joined the United States Pacific Railroad exploring expedition (1853) as mineralogist and geologist. In 1861 he became mining engineer for the Japanese government, and with R. Pumpelly organized the first school of science in Japan. As an expert in his specialty he was connected in important capacities with the Paris Exposition of 1867, the Vienna Exposition (1873), United States Centennial Exhibition (1876), Paris Universal Exposition (1878), and drafted the system of classification of United States ores and minerals at the Columbian Exposition (1893). He has conducted important explorations in Alaska, California, and Nevada, and the chief mining districts of the United States, frequently publishing his results in valuable reports and scientific papers. Since 1894 he has been professor of geology and director of the school of Mines, Univ. of Arizona, and territorial geologist. Publications: *Silver Ores and Silver Mines* (1861); *California Minerals* (1863); *Production of the Precious Metals* (1867); *Iron and Steel* (1873); *Ceramic Art and Glass* (1878); *History of the Town of Hamden, Conn.; Life of Captain Jonathan Mix.*

BLAKE, William Rufus, American actor: b. Halifax, N. S., 1805; d. Boston, 1863, April 22. His first appearance on the American stage was at the old Chatham Theatre, New York, under the management of Mr. Barrere, in 1824, as Frederic in *The Poor Gentleman*, and in Elliston's favorite character in *The Three Singles*. His success was great. Jesse Rural, in *Old Heads and Young Hearts*, was one of his best parts. Mr. Blake was a fluent and effective speaker. He was stage manager of the Tremont Theatre, Boston, joint manager of the Walnut Street Theatre, Philadelphia, and stage manager of the Broadway Theatre, New York.

BLAKELEY, *blāk'lē*, Johnston: naval officer: 1781–1814; b. near Seaford, co. Down, Ireland. When he was 2 years of age, his father emigrated with him to America and settled in Wilmington, N. C. B. was at school in New York 1790–92; then entered the Univ. of N. C.; but his father dying 1797, the lad, left alone in the world, gave up his studies to earn a livelihood. He was appointed midshipman 1800, lieut. 1807. In the war of 1812, commanding the brig *Enterprise*, he rendered good service, guarding the coast, till, being appointed master commander, he was assigned to the sloop *Wasp*. On a cruise, the *Wasp* encountered the British brig *Reindeer*, and after a desperate hand to hand struggle, the British vessel struck her colors. B. burned the prize and sailed for L'Orient. Homeward-bound he captured and sank many vessels; but the *Wasp* never returned.

BLAKELOCK, *blāk'lŏk*, Ralph Albert, artist: b.

New York, 1847, Oct. 15. He graduated at the College of the City of New York in 1867, and it was intended that he should follow his father's profession of medicine, but he developed a strong taste for music and the arts, and without a master taught himself painting. He has painted landscapes, moonlight scenes, and Indian figures; one of the last-named represents the Ta-vo-kok-i, or circle-dance of the Kavavite Indians. His work is very striking on account of its harmonious color-schemes.

BLAKESLEY, *blāks'lĭ*, JOSEPH WILLIAMS, English clergyman: b. London, 1808, March 6; d. Lincoln, 1885, April 18. He graduated at Trinity College, Cambridge, in 1831; was Fellow there 1831–45, and select preacher 1840–3; became a member of the New Testament Committee on Bible Revision in 1870; became dean of Lincoln in 1872. His publications include *Life of Aristotle* (1839); *Conciones Academicæ* (1843); and an edition of *Herodotus* (2 vols., 1852–4).

BLAKEY, *blāk'ĭ*, ROBERT, English writer: b. Morpeth, Northumberland, 1795, May 18; d. Belfast, 1878, Oct. 26. He bought the Newcastle *Liberator* in 1838, and got himself into trouble with the government on account of certain alleged seditious articles which he published. In 1848 he became professor of logic and metaphysics at Queen's College, Belfast. Among his works are *Treatise on the Divine and Human Wills; History of Moral Science; Historical Sketch of Logic; Temporal Benefits of Christianity* and *The Angler's Song Book.*

BLAME, v. *blām* [F. *blâmer*, to blame—from O. Fr. *blasmer*—from L. *blasphemārĕ*, to revile, to defame, to blame: Gr. *blasphēmein*, to speak injuriously, to defame]: to find fault with, to censure: N. censure; crime; expression of disapprobation; reproach. To BLAME, in fault; blameworthy, as they are *to blame.* BLA'MING, imp. BLAMED, pp. *blāmd.* BLAME'WORTHY, a. *-wėr-thĭ*, worthy of blame or censure; culpable. BLAME'WOR'THINESS, n. BLAME'FUL, a. *-fûl*, meriting blame. BLAME'FULLY, ad. *-fûl-lĭ.* BLAME'FULNESS, n. BLA'MER, n. one who. BLAMABLE, a. *blā'mă-bl*, deserving of censure; faulty; culpable. BLA'MABLY, ad. *-blĭ.* BLA'MABLENESS, n. *-bl-nĕs*, the state of being worthy of blame. BLAMELESS, a. *blām'lĕs*, without fault; innocent; free from blame; guiltless. BLAME'LESSLY, ad. *-lĭ.* BLAME'LESSNESS, n. state of being free from fault or blame, innocence.—SYN. of 'blame, v.': to condemn; reproach; chide; censure; reprove; upbraid; animadvert; rebuke; reprimand;—of 'blame, n.': fault; sin; censure; reprehension; crime; condemnation; reproach;—of 'blameless': innocent; faultless; guiltless; spotless; stainless; irreproachable; unblemished; unspotted.

BLANC, *blŏng*, ANTHONY, American clergyman: b. Sury, France, 1792, Oct. 11; d. New Orleans, 1860, June 20. He was ordained to the Roman Catholic priesthood in 1816; went to Annapolis, Md., in 1817; was appointed

bishop of New Orleans in 1835; and became archbishop there in 1850.

BLANC, Jean Joseph Louis: 1811, Oct. 29—1882, Dec. 6; b. Madrid, Spain: French socialist and historian. In 1820, he was placed in the college at Rhodez; in 1830, he went to Paris, and became a clerk in an attorney's office; but in 1832, became tutor of the son of M. Hallette, of Arras. Here he resided for two years, contributing largely, on literary and political subjects, to the *Progrès du Pas-de-Calais.* He afterwards went to Paris, where he contributed to various political papers, and where, 1838, he founded the *Revue du Progrès Politique, Social et Littéraire,* in which he laid down in a more quiet and leisurely way his socialistic theory. In this he brought out his chief work on Socialism, the *Organisation du Travail,* which, 1840, appeared in a separate form. The book obtained for its author a wide, enthusiastic popularity among the French, *ouvriers,* who were captivated by the brilliancy of the writing, the symmetrical simplicity of the scheme, and the freshness of the views advocated. The book denounces the doctrine of individualism—i.e., individual and competitive efforts in labor—and advocates the absorption of the individual in a vast 'solidarity,' where 'each would receive according to his needs, and contribute according to his abilities.' B. next published (1841–44) a historical work entitled *Révolution Française: Histoire de Dix Ans.* 1830-40, which produced a deadly effect on the Orleans dynasty. Louis Philippe afterwards declared that 'it acted like a battering-ram against the bulwarks of loyalty in France.' It owed its success partly to the exposure it gave of the scandalous jobbery and immorality of the crown and its advisers, partly to its passionate vehemence, and partly to its academic pomp of style. This was followed by the first vol. of a *Histoire de la Révolution Française,* in which the author's aim was not only to describe, from his own point of view, the incidents of the first revolution, but the social history of the 18th c. On the breaking out of the revolution of 1848, Feb., B. seemed likely to be a leader. His connection with the party of the *Réforme* journal, and his popularity with the working-classes, led to his being appointed a member of the provisional government. He was placed at the head of the great commission for discussing the problem of labor. At the same time, Marie, minister of public works, began—but without B.'s co-operation—to establish the so-called national workshops (see Ateliers Nationaux) which were intended to realize the socialistic principle. The national workshops led to the arrest of 1848, May 15, though B. was not responsible for them nor for their failure. A proposal was made to prosecute him, but it was negatived by the national assembly. After the June insurrection, he was again accused, and prosecuted for conspiracy, but contrived to escape to London, where he spent many years. During his exile, he devoted himself to political and historical literature. In 1849 appeared his *Appeal aux Honnêtes Gens,* and

Catéchisme des Socialistes; in 1850, *Pages d'Histoire de la Révolution de Février;* and in 1851, *Plus de Girondins; la République Une et Indivisible.* The work which has secured him the most enduring reputation in his *History of the French Revolution*, written during his residence in England. It is characterized by extensive and original research, which has frequently enabled the author to reverse the common verdicts on historical personages, and to disprove many of the extravagant stories of the stormy period of which it treats. In style, it is eloquent, bold, and dignified; and while its sentiments do not always commend themselves to sober judgment, there can be but one opinion in regard to its candor, impartiality, and power. On the fall of the empire, B. returned to France, was chosen to the national assembly 1871, and sat for Paris till his death. He voted usually with the extreme left.

BLANC, Le, *lė-blŏng':* town of France, dept. of the Indre, with a beautiful situation on the Creuse, which divides the town into two parts, about 32 m. w.s.w. of Châteauroux. Above B., the river expands so as to form a lake, but at the town it contracts, and breaks into cascades with sufficient fall to turn machinery of several manufactories. B. is a thriving place, with cloth and linen yarn mills, potteries, tanneries, vinegar-works, forges, etc. It is very ancient, having been frequented by the Romans. It was formerly strongly fortified, but the fortifications are dismantled. Pop. 7,000.

BLANC, Lugwig Gottfried, German philologist: b. Berlin, 1781, Sept. 19; d. Halle, 1866, April 18. He was educated at the French Theological Seminary in Berlin and ordained as pastor at Halle. In 1811 he was accused of taking part in a conspiracy against the king of Westphalia, and was imprisoned at Magdeburg, and later at Kassel, until released in 1813 by a Russian skirmishing corps. He was chaplain in the Prussian army in the war of 1814–15; from 1822 was professor of the Romance languages at the Univ. of Halle; and in 1860 was appointed preacher at the cathedral in that city. He was an authority on the Romance languages and especially on the works of Dante. In connection with his study of Dante he wrote a *Dante Vocabulary* (in French); *Attempt at a Philological Explanation of Several Disputed Points in the 'Divine Comedy';* and translated the *Divine Comedy* into German. He has written also *Grammar of the Italian Language;* and a *Handbook of the Most Remarkable Facts of Nature and the History of the Earth and Its Inhabitants.*

BLANC, Marie Thérése (Thérése Bentzon), French novelist and littérateur: b. Seine-Port, 1840, Sept. 21. She has been for many years on the editorial staff of the *Revue des Deux Mondes*, to which she has contributed notable translations and reviews of many American, English, and German authors. Her literary essays on these contemporaneous writers were collected in *Foreign*

Literature and Customs (1882), and *Recent American Novelists* (1885). Her first work to attract attention was *A Divorce* (1871), published in the *Journal des Débats*. Two other novels, *A Remorse* (1879), and *Tony* (1889), were crowned by the French Academy. Other stories are *Georgette* and *Jacqueline* (1893); *Condition of Woman in the United States* (1895).

BLANC, Mont: see Mont Blanc.

BLANC, Paul Joseph, French genre painter: b. Paris 1846; d. Paris 1904, July 5. He studied under Bin and Cabanel. He won the Grand Prix de Rome in 1867; the first-class medal of the Paris Salon in 1872; the decoration of the Legion of Honor in 1878; and the first-class medal in the Paris Exposition of 1889. One of his best-known works is a decorative composition depicting the consecration, baptism, and triumph of Clovis.

BLANCH, v. *blănsh* [F. *blanchir*, to whiten—from *blanc*, white—from O.H.G. *blanch:* Dan. *blank*, shining, polished]: to make white; to take out the color. Blanch'ing, imp.: Adj. becoming pale or white; whitening: N. the operation of brightening pieces of silver, or of making other metals white like silver; the operation of whitening vegetables by covering them from the light. Blanched, pp. *blănsht*. Blanch'er, n. one who.

BLANCHARD, *blăn'shârd*, Edward Laman, English dramatist and novelist: b. London, 1820; d. 1889. His novels, *Temple Bar* and *A Man Without a Destiny*, evinced no special talent for story-telling; on the other hand he composed for Drury Lane Theatre about 100 Christmas pantomimes in the vein of grotesque burlesque, among them *Sinbad the Sailor*, which were received with unbounded popular favor.

BLANCHARD, *blŏng-shär*, Emile, French naturalist: b. Paris, 1819, March 6. He is especially renowned as an entomologist, and is the author of many scientific works, including *Researches into the Organization of Worms* (1837); *Natural History of Orthopterous and Neuropterous Insects* (1837–40); *History of Insects*, etc. (1843–5).

BLANCHARD, Jonathan, American educator: b. Rockingham, Vt., 1811, Jan. 19; d. Wheaton, Ill., 1892, May 14. He graduated at Lane Theological Seminary in 1832 and was ordained a Presbyterian minister in 1838. He was American vice-president of the World's Anti-Slavery Convention in London in 1843; and in 1846 became president of Knox College at Galesburg, Ill. He was president of Wheaton College, Ill., 1880–82; and, on resigning, was chosen president-emeritus, and subsequently gave most of his time to editing *The Christian Cynosure*.

BLANCHE FERME, *blănsh fėrm* [F. *blanche*, feminine form of *blanc*, white; *ferme*, a farm: AS. *feorm*, what goes to support life: mid. L. *firma*, money, rent]: a phrase denoting an acknowledgment of vassalage by the payment

of a sum of white money or silver, instead of victuals. BLANCH-HOLDING, or BLENCH-HOLDING, a tenure by which the tenant is bound to pay only a trifling or elusory duty; on abolition of ward-holding, all lands held of the crown were converted into *blanche*-holding (see CHARTER: TENURE OF LAND). BLANCH-FARM, in *OE.*, an annual rent or duty paid to the lord of the manor.

BLANCHE-LYON, *blănsh lē-ōn′:* title of one of the English pursuivants-at-arms: see PURSUIVANT.

BLAN′CHET, JOSEPH GODERICK, Canadian statesman: b. Saint Pierre, 1829. He studied medicine, graduating from the College of Saint Anne; but has been especially active in public life; he has been mayor of Levis, speaker of the Provincial legislature of Quebec for seven years, and member of the Canadian Assembly, from which he resigned on account of the law on dual representation.

BLANCHING, in Gardening: a process to prevent certain secretions which in ordinary circumstances take place in the leaves of plants, and to render them more pleasant and wholesome for food. The action of light is indispensable to the decomposition of carbonic acid by the leaves of plants, and, consequently, to the elaboration of many of the substances from which they derive their peculiar qualities: the exclusion of light, therefore, not only makes the stalks and leaves of plants white or nearly white, but also modifies their qualities, and, as in sea-kale and celery, makes quite palatable plants which are naturally coarse and bitter. B. is accomplished in various ways according to the position of the plant which it is desired to keep free from color. The usual methods are by covering the plants with earth; boards, straw, paper, etc., or, in a small way, with inverted flower-pots, kegs, etc. In cabbage and other plants whose leaves form compact heads, there is a natural B. or etiolation.

BLANC-MANGE, n. *blŏng-mŏngzh′*, or simply *blă-mŏngzh′*, also BLANCMAN′GER, n. *-zhā* [F. white food or jelly]: a confected white jelly. BLANC-FIXE, n. *blŏng-fĭks* [F. *fixe*, fixed, firm]: a white paint composed of sulphate of barium.

BLANC-MANGE: so called from its white appearance; jelly made of gelatin and milk. The following is the ordinary recipe for making it: Take a quart of sweet milk or cream, and put in it two ounces of the best gelatin, with the rind of a lemon, a blade of mace, and white sugar to taste. Put the whole in a saucepan, and let it boil a quarter of an hour; then mix with six bitter almonds and 24 sweet ones, beaten into a paste with a little water; strain through a piece of muslin; and having let the composition settle a little, pour into a mold, and turn it out when cold. B. is also made of calf's-foot jelly and eggs, of arrow-root and milk, etc.; and the flavor is modified to taste.

BLANCO, *blân′kō*, CAPE: remarkable headland on the

w. coast of Africa; lat. 20° 47′ n.; long. 16° 58′ w.; the extremity of a rocky ridge (called Jebel-el-Bied, or White Mountain) which projects from the Sahara in a westerly direction, and then bending s. forms a commodious harbor called the Great Bay. The bay and town of Arguin, supposed to have been the limit of ancient navigation in this direction, lie some miles south. Southward to the mouth of the Rio Grande the shores are low and sandy, with a current tending s.w., and prevalent n.e. trade-wind; n. from Cape B. to Cape Geer, the coast is rocky, with a moderate elevation. The natives of the Canary Islands carry on a lucrative fishery in the bay. Cape B., which is composed of mixed calcareous and silicious sandstone, was discovered by the Portuguese, 1441.

Cape B. is also the name of several less important headlands in Spain, Greece, America, and the Philippines.

BLAND, Edith Nesbit (E. Nesbit), English writer: b. London, 1858, Aug. 15. She was married to Hubert Bland, 1879. She has written several volumes of verse, as well as a series of popular children's books and several novels. Her published works include: *Lays and Legends* (1886–92); *Leaves of Life* (1888); *A Pomander of Verse* (1895); *Grim Tales* (1893); *Something Wrong* (1893); *The Marden Mystery* (1896); *Songs of Love and Empire* (1897); *The Secret of Kyriels* (1898); *The Story of the Treasure Seekers* (1899); *Pussy and Doggy Tales* (1899); *The Book of Dragons* (1900); *The Would-be Goods; Nine Unlikely Tales; Thirteen Ways Home* (1901); *Five Children and It* (1902); *The Red House* (1903); *The Literary Sense* (1903); *The Phœnix and the Carpet* (1904); *The Rainbow and the Rose* (1905); with Hubert Bland, *The Prophet's Mantle* (1889); with Barron, *The Butler in Bohemia* (1894).

BLAND, Richard Parks: an American legislator; b. 1835, Aug. 19; practised law in Missouri, California, and Nevada, and for some time engaged in mining. He settled in Lebanon, Mo., in 1865; was a member of congress in 1873–95 and 1897–99; and was a candidate for the presidential nomination at the democratic national convention in 1896, but his name was dropped on the fourth ballot, and the vote of his state was given to William J. Bryan. Mr. Bland was known as the author of the Bland Silver Bill and as the leader of the free-silver movement in the house of representatives. D. 1899, June 15.

BLAND, Theodoric: 1742–90: revolutionary soldier; b. in Prince George co., Va. At the age of eleven he was sent to Wakefield, England, to receive his preliminary education. After completing the medical course at the Edinburgh Univ. he practiced medicine in England until 1764, when he returned to America. He assisted in removing from Dunmore's palace the arms and ammunition which that officer had taken from the arsenal, and afterwards gave vent to his indignation against the governor in a series of letters signed 'Cassius.' He was capt. of the first troop of cavalry of Virginia, became lieut.col. (1777),

later col.; was an excellent officer, having the confidence of Washington throughout the war. As member of the Virginia convention of 1788, he opposed the adoption of the federal constitution. In 1789, Mar. 30, he took his seat as representative in the first congress. He died during its sessions the next year, and was buried in Trinity churchyard, New York.

BLAND'FORD, or BLAN'FORD: town in the s. w. of Mass. (Hampden co.) abt. 5 m. w. of the Westfield river and 20 m. w.n.w. of Springfield. Having an elevation of abt. 2,000 ft., with pure air and picturesque views, it has become a favorite summer resort. It has manufactures and a public library. Pop. (1900) 836; (1910) 717.

BLAND'FORD-FO'RUM, or MARKET BLANDFORD: town in Dorsetshire, on the right bank of the Stour, 16 m. n.e. of Dorchester; in a fine tract of pasture-land, famed for its multitude of cows. It suffered much in 1579, 1677, 1713, and 1731, from fire. It is built of brick, and is neat and regular. It was formerly famed for its manufactures of bandstrings and lace, the point-lace bringing £30 a yard. Shirt-buttons are made, and the town has an active agricultural trade. Pop. 4,000. Pop. (1871) 4,011; (1881) 3,753; (1891) 3,974; (1901) 3,649.

BLANDISH, v. *blăn'dĭsh* [OF. *blandissant*, blandishing —from OF. *blandir*, to flatter—from L. *blandīrĭ*, to caress —from *blandus*, gentle]: to caress; to flatter by caress; to soothe; to soften. BLAN'DISHER, n. one who. BLAN'DISHING, imp. BLAN'DISHED, pp. *-dĭsht*. BLAN'DISHMENT, n., and BLAN'DISHING, n. soft words tending to win the heart; caresses.

BLANDRATA, *blân-drâ'tâ*, GIORGIO: d. 1590; b. Saluzzo, Italy: founder of Unitarianism in Poland and Transylvania. He had established himself as a physician at Pavia, when he was compelled, on account of his heretical opinions, to fly to Geneva in 1556, where at first, and to avoid further molestation, he feigned to agree with Calvin. In 1558, he went to Poland; hoping to find there greater freedom of thought and speech; and in 1563 he betook himself to the court of John Sigismund, Prince of Transylvania, whose favorite physician he became. Here he exerted himself prudently but assiduously to spread his doctrines, and succeeded in forming a considerable party. In his old age, however, the heat of his proselytizing zeal died out; and it is asserted that, to preserve his worldly interests, he even forsook the cause of the Unitarians, and favored the Jesuits, who were in high esteem with the prince. He was murdered by his nephew, whom he had threatened to disinherit on account of his attachment to the Rom. Cath. Church. B.'s religious treatises are destitute of importance.

BLANE, *blān*, Sir GILBERT: 1749, Aug. 29—1834, June 26; b. Blanefield, Ayrshire: physician. He studied at Edinburgh Univ., and became private physician to Lord Rodney whom he accompanied in 1780, when Rodney took com-

mand of the West Indian squadron. On one occasion, when all the officers were wounded, B.'s bravery was so conspicuous, that Lord Rodney immediately obtained for him the appointment of physician to the fleet. In 1785, he was elected physician to St. Thomas's Hospital, London, having previously been appointed physician-extraordinary to the Prince of Wales. In 1795, he was chosen head of the navy medical board. In 1812, he had a baronetcy conferred upon him, and in the same year the prince regent made him his physician in ordinary. When the Duke of Clarence ascended the throne as William IV., 1830, he made B., then 81 years old, his first physician. He published several valuable works, the most popular and useful of which are, *Observations on the Diseases of Seamen*, a lecture on *Muscular Motion*, and *Elements of Medical Logic*.

BLANK, a. *blăngk* [F. *blanc*, white: Dan. *blank*, shining: Ger. *blinken*, to shine]: white; denoting an unwritten ticket, or one not obtaining a prize; empty; void; confused; confounded, as applied to looks or countenance; in *verse*, without rhyme: N. a void; any empty space; paper unwritten on or without marks; a ticket without value; a written or printed form of a legal instrument with vacant spaces for names, dates, etc. V. to make void or empty; to confuse; to efface or rub off. BLANK'ING, imp. BLANKED, pp. *blăngkt*. BLANK'LY, ad. *-lĭ*. BLANK'NESS, n. state of being blank; confusion. BLANK CARTRIDGE, one filled with powder only; see CARTRIDGE. FIRING BLANK, discharging a cannon or gun loaded with powder only. POINT-BLANK, the shot of a gun levelled horizontally, the shot proceeding in a straight line without curving.

BLANK BONDS: Scotch securities in which the creditor's name was left blank, and which passed by mere delivery, the bearer or holder being at liberty to insert his name in the blank space, and sue for payment. They were discarded, 1696, for liability to fraud.

BLANKENBURG, *blân'kĕn-bėrg:* town in the duchy of Brunswick, 37 m. s.s.e. of the capital; on the borders of the Harz Mountains, 732ft. above the sea. It has a gymnasium, and several charitable and educational institutions. The people are engaged largely in mining, iron, marble, and dye-earths being plentiful in the surrounding districts. On the Blankenstein, a rocky height immediately adjoining the town, there is a palace belonging to the Duke of Brunswick; and on the lofty summit of the Regenstein, about half a mile distant, there are the remains of a large castle, with many chambers, hewn out of the rock by Henry the Fowler in 919. Louis XVIII. resided at B. as Comte de Lille, 1796–98. Pop. 8,000.

BLANKET, n. *blăngk'ĕt* [OF. *blanket*, and *blanchet*, a white woolen cloth, a blanket—from *blanc*, white]: a soft, coarse, lightly woven, woolen cover for a bed: V. to toss in or cover with a blanket. BLANK'ETING, imp.: N. cloth for blankets. BLANK'ETED, pp. WET BLANKET, a damper

for fire; any thing or person tending to cool ardor; a sore discouragement.

BLANK VERSE: verse without rhyme (q.v.), and depending upon metre (q.v.) alone. The classical productions of the Greek and Roman poets—at least such as have come down to us—are composed on this principle; accordingly, when the passion for imitating classical models set in, rhyme came to be looked upon as an invention of Gothic barbarism and attempts were made in most countries to shake it off. The first specimen of blank verse in English is a translation of the second and fourth books of Virgil's *Æneid*, by the Earl of Surrey, who was put to death 1547; but it had been used by Italian and Spanish writers as early as about the beginning of the 16th c. In England, its adaptation to the drama was at once felt, and in that department of poetry it soon became and has continued dominant—if we except the effort made by Dryden and others, after the Restoration, to return to rhymed plays; but in other kinds of poetry, it was not till the appearance of *Paradise Lost* (1667) that it could be said to have taken root; and even then the want of rhymes was felt, as the poet expected it would be. Many poets have followed Milton's example; and English narrative, didatic, and descriptive poetry, is partly in B. V., partly in rhyme. It is chiefly in 'heroic' metre, as it is called—that is, in verses or lines of ten syllables—that blank verse has found a firm footing. Some, in fact, would restrict the name blank verse to lines of ten syllables, not considering it applicable to such metres as those of Southey's *Thalaba* and Longfellow's *Hiawatha*.—Dramatic B. V. is characterized by the frequent occurrence of a supernumerary syllable at the end of the line:

> To be | or not | to be, | that is | the ques|*tion:*
> Whether | 'tis no | bler in | the mind | to suf|*fer.*

In Italian and Spanish, B. V. never became popular, and still less in French. The German language seems to admit every variety of blank metre.

BLANQUI, *blŏng'ke*, JÉRÔMO ADOLPHE: 1798, Nov. 28—1854, Jan. 28; b. Nice: one of the first French economists. He was educated at the Lyceum of Nice. In 1814, young B. went to complete his studies at Paris, where he became acquainted with J. B. Say, who induced him to study political economy. In 1825, by Say's recommendation, he was appointed prof. of history and of industrial economy in the Commercial School at Paris. On the death of Say, he was appointed prof. of industrial economy in the Conservatoire des Arts et Métiers, and was one of the editors of the *Dictionnaire de l'Industrie Manufacturière, Commerciale, et Agricole*. In 1838, June, he became a member of the Acad. of Moral and Political Science. The Acad. sent him to Corsica, to study the condition of that country and, 1839, to Algiers for the same purpose. In 1841, he visited Turkey. In 1851, the Acad. requested him to furnish a complete account of London in its financial and

other aspects. He died at Paris. B. as a national economist, was somewhat inclined to socialism. Like his master, Say, he was in favor of free-trade. In method, he is ingenious; in style, transparent; and even the driest discussions become interesting, from his lively mode of treating them. His principal works are—*Voyage d'un Jeune Français en Angleterre eten Ecosse* (Paris, 1824); *Résumé de l'Histoire du Commerce et de l'Industrie* (Paris, 1826); *Précis Elémentaire d' Économie Politique, précédé d'une Introduction Historique, et suivi d'une Biographie des Économistes*, etc. (Paris, 1826); and, most important of all, the *Histoire de l'Économie Politique en Europe, depuis les Anciens jusqu'à nos jours, suivie d'une Bibliographie raisonnée des Principaux Ouvrages d' Économie Politique.*

BLANQUI, Louis Auguste: 1805, Feb. 7—1881, Jan. 1; bro. of Jérôme Adolphe B. He made himself conspicuous, chiefly by advocacy of the most radical political opinions. After the revolution of February, he formed the Central Republican Soc., which menaced the existence of the provisional govt. He it was also who organized the revolutionary *attentat* of May 15, the aim of which was to overthrow the constituent assembly. At the head of an excited mob, he made his appearance before the national representatives, and with that tendency to emancipate the world which is not unknown to the French patriot, demanded the *resuscitation of the Polish nationality!* His coadjutor, M. Huber, went a step further, and pronounced the dissolution of the assembly. The latter proved itself strong enough to crush this movement. B. was arrested and condemned to ten years' imprisonment in Belleisle. In 1861, he was sentenced to other four years' imprisonment. He appeared again as one of the most active spirits in the red republican movement of 1870–1, took a prominent part in the Commune, and once more became a prisoner of state, being released in 1879.

BLAPS: genus of insects, of the order *Coleoptera*, type of a tribe called *Blapsides*, the species of which are numerous, all of dark color, destitute of wings, and having the elytra or wing-cases united together. They run slowly however, in comparison with many kinds of beetles, and inhabit dark and damp situations, feeding chiefly on dead vegetable matter. They have the power of secreting and emitting a brownish, acrid, irritating fluid, of a peculiar and penetrating odor, with which they appear to be furnished for the purpose of self-defense, and which some of them are capable of throwing to a distance of six or eight inches. *Blaps mortisaga* is a common British species, of about an inch long, and of a shining black color. It is sometimes called Darkling Beetle, and Church-yard Beetle, sometimes seems to share with the Cockroach (q.v.) the appellation of Black Beetle. It is a frequent companion of the cockroach in pantries and cellars.—*Blaps sulcata* is cooked with butter and eaten by Turkish women in Egypt, under the notion that it will make them

fat, this being, in their estimation, one of the chief points of beauty.

BLARE, n. *blär* [Dut. *blaeren*, to bubble; to blister: Gael. *blor*, a loud noise]: a roar; a bellowing noise: V. to bellow; to roar. BLA'RING, imp. BLARED, pp. *blārd*.

BLARNEY, n. *blâr'nĭ* [from a legend connected with *Blarney* Castle, 4 m. n.w. of Cork, Ireland: comp. Gael. *bladhair*, to flatter; *nighean*, the girl]: cajoling talk, especially in courting a woman; smooth deceitful talk; flattering, untruthful words. On the top of the tower of Blarney Castle (built 1449 by Cormac McCarty) is the Blarney stone, which, if kissed, is fabled to endow with the gift of wheedling and cajoling.

BLASÉ, a. *blâ'zā* [F. *blasé*, cloyed—from *blaser*, to pall, to blunt: comp. Gael. *blas*, taste, flavor]: rendered incapable, by excess, of further enjoyment: N. one rendered incapable by excesses of further enjoyment. BLASÉS, n. plu. *blâ'zāz*.

BLA'SIUS: d. 316: saint and martyr; Bishop of Sebaste, in Cappadocia, when Licinius began a bloody persecution of the Christians. B. left the town, and concealed himself in an unknown chasm in the rocks, but his abode was discovered by Agricola, while hunting. The saint was conveyed to Sebaste, and as he steadfastly refused to deny Christ and worship the heathen gods, he was put to death with most horrid cruelty. At one period his worship must have been widely diffused, judging from the extent of territory over which his relics were scattered. The woolcombers claim him as their patron, for the singular reason that he was tortured, among other instruments, with a wool-comb. At Bradford, in Yorkshire, there is a septennial procession of that craft on his day, Feb. 3. The practice of invoking St. B. in cases of sore throats is said to have originated in the circumstance that, when young, he saved the only son of a rich widow from being choked by a fish-bone. It has been conjectured, however, that the wool-comb has probably been mistaken for a fish-bone, and that the story of the rich widow's only son is a myth elaborated in explanation of the circumstance.

BLASPHEME, v. *blăs-fēm'* [F. *blasphémer*—from L. *blasphēmārĕ*, to revile, to defame—from Gr. *blasphēmein* (see BLAME)]: to speak of God with irreverence; to speak in impious terms of any of God's names and attributes; to curse or swear; to speak abusively. BLASPHE'MING, imp. BLASPHEMED', pp. *-fēmd'*. BLASPHE'MER, n. one who. BLASPHEMOUS, a. *blăs'fĕ-mŭs*, impious; containing blasphemy. BLAS'PHEMOUSLY, ad. *-ŭs-lĭ*. BLASPHEMY, n. *blăs'fĕ-mĭ*, irreverence in speaking of God; profane language.

BLAS'PHEMY: an offense against God and man, by denying to the Almighty his being and providence; or by contumelious reproaches of the Lord and Saviour Jesus Christ; also all profane scoffing at the Holy Scriptures, or

exposing them to ridicule and contempt. Moreover, in England, seditious words in derogation of the established religion may be proved under a charge of blasphemy. These all are offenses punishable at common law by fine and imprisonment, or other infamous corporal punishment; for Christianity is held to be part of the laws of England; and a blasphemous libel may be prosecuted as an offense at common law, and punished with fine or imprisonment. Any general attack on *Christianity* is also the subject of criminal prosecution, because Christianity is the public religion of the country. Thus, in England, as an offense against religion, B. may assume one of two forms: first, either as against the articles and creeds of the Established Church; or secondly, as against a dissenting community, in the libel against whom a general attack on the Christian religion is involved. The B. must in some manner have been overtly and publicly declared, either by a speech on some public occasion, or by the act of publication in print.

The Scotch law regarding this offense is now much the same. The old severe Scotch acts, one passed 1661, another 1695, which provided capital punishment for offenses of this description, were repealed by the 53 Geo. III. c. 160.

In the United States B. is a misdemeanor at common law; and the statutes of some states, especially New England states, define punishment for it. It is defined as an intentional use of words fitted to destroy the reverence and trust due to Almighty God as the Creator, Preserver, and Ruler of the World; but an attack on any organized church, as such, is not B. in law; nor is a sober discussion denying the existence of God. In many states gross profaneness is held to involve a less degree of B.; but the enforcement of this law is infrequent. As to the grounds of our laws against B., it is generally conceded that in a Christian land the open contumely of God is an offense against public peace and order—invading the rights of the *citizens*. That, behind this, the law also retains from former times a purpose to assert the right of *God* to be reverenced, is asserted by some, and utterly denied by others.

BLAST, n. *blăst* [AS. *blæsen*, to blow; *blæst*, a blast; Icel. *blastr*, a breath]: a violent rush of wind; the sound of a wind instrument, any influence destructive of life; an explosion of gunpowder; the air introduced into a furnace: V. to cause to wither; to blight; to affect with a sudden calamity; to destroy; to confound; to split rocks by gunpowder. BLAST'ING, imp.: N. the act of separating stones or rocks from their beds by blowing them up with gunpowder. BLAST'ED, pp.: ADJ. accursed; detestable; made infamous; affected by some cause injurious to growth or life. BLAST'ER, n. one who or that which. BLAST-MACHINE: see BLOWING-MACHINE. BLAST-PIPE, the waste-steam pipe in locomotive engines, of prime importance in causing a greater draught in the fire-tubes and through the fire-grate. BLAST-FURNACE, a furnace for smelting iron ore, etc.,

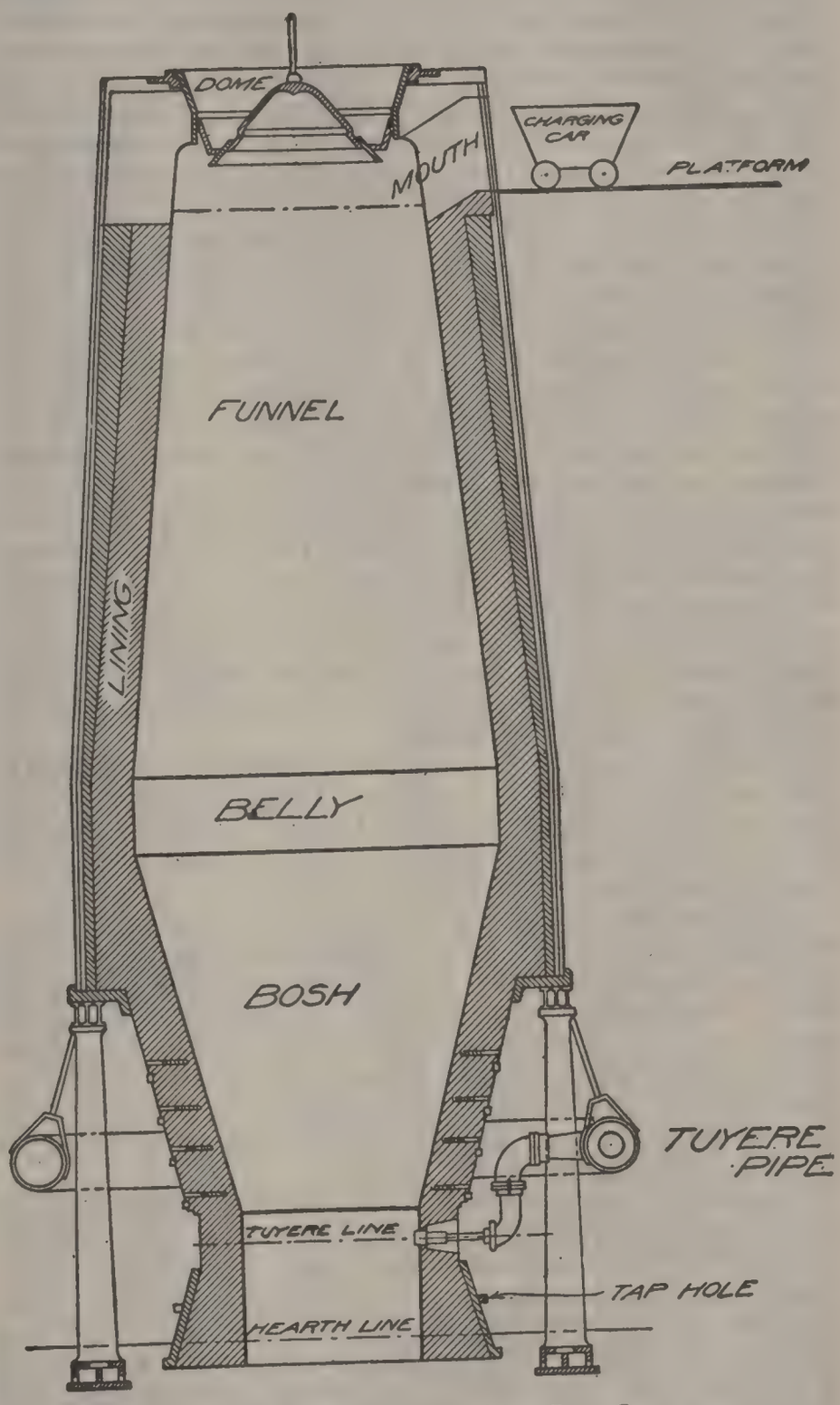
whose heat, is vastly increased by air, generally heated, being forced into it by machinery—the air so introduced is called *the blast.* BLAST-HOLE, the induction water-hole at the bottom of a pump-stock.

BLASTEMA, n. *blăs-tē′mă* [Gr. *blastēma,* a sprout, offspring—from *blastăno,* I germinate]: in *surg.*, a sub-transparent glairy matter, containing a multitude of minute corpuscles forming the basis of part of an animal, as the *blastema* of bone—an obsolete term for *protoplasm;* in *bot.*, the whole of the embryo after the cotyledons have been abstracted. BLASTE′MAL, a. *-măl,* pertaining to; rudimentary.

BLAST FURNACE: a structure of refractory (heat-resisting) material in which ore and fuel are introduced at the top and smelted by heat aided by air-blasts, molten metal being drawn off at the bottom. B. F. are used for the making of pig iron, also for copper, silver, etc. The modern type, as used for smelting iron ore, is shown in the illustration. Such furnaces may be from 50 to 90 or 100 feet in height; they are usually circular in form, though smaller sizes, made for special purposes, are sometimes square in section. The ore is fed or 'charged' at the top, being mixed with a suitable flux (as limestone) to promote fusion. Layers of ore and layers of fuel (the latter usually coke) are charged alternately. The furnace increases in diameter from the top downward to the belly, in order to prevent the material from becoming jammed and choking. The sloping lower portion, where the furnace narrows towards the hearth, is termed the boshes, and the lower sides are the bosh-walls. Within the boshes the smelting is accomplished, and the molten metal gradually fills up the hearth, the slag and impurity rising to the surface of the heated mass. The hot flowing metal is drawn off at intervals through tap-holes and conveyed to moulds that cast it in pigs. To stop the flow of hot metal from the B. F. after the tapping, the clay-gun is employed. This shoots balls of moist clay at the tap-hole until it is closed, after which the metal accumulates for another tapping. Such furnaces are kept running continuously, day and night, producing several hundred tons of pig iron in 24 hours.

The air-blast is furnished through tuyere (pronounced tweer) pipes, several of which protrude from nozzles into the hearth. These nozzles are commonly of bronze and have double linings; between the linings water is circulated to keep down the temperature, otherwise they would melt with the great heat. The air is sent to these tuyeres under pressure. It was formerly blown in cold, but it was found that if the air were heated to 800 or 1000 degrees F. the production of the furnaces increased. This heating is done in hot-blast stoves, so called. They are really large cylinders, sometimes 25 feet in diameter and over 100 feet long, in which firebrick are placed, so as to leave alternate air-spaces and bricks, this being called checker-work. Waste gas from the top of the B. F. is

BLAST FURNACE.



Blast Furnace for Smelting Iron Ore.

led into a series of these hot-blast stoves and there burned, raising the checker-work to a high heat. Air is then passed through, heating by contact with the bricks.

In 1904 James Gayley demonstrated that a B. F. could be run more economically by removing the moisture from the air before heating. The varying degree of humidity—that is of suspended water vapor in the air—producing a serious deterrent effect on the burning of the coke in the B. F., thus checking the production of the furnaces. To get rid of this moisture, and secure a dry or desiccated blast, Gayley passed the air through refrigerating chambers in which a temperature of about twelve below zero was maintained. The air circulating among a set of cold pipes was relieved of its moisture, which adhered to the pipes in the form of frost. The dry air thus obtained was then led through the hot-blast stoves and blown through the tuyere nozzles to the B. F. It was found that this air, dried by refrigeration, with a lessened pressure and about 15 per cent. less fuel, would produce about 10 per cent. more pig iron, and that the pig iron was much more uniform in its chemical constituents and of a higher commercial value. Thus the curious condition has been reached by which the blast for such furnaces is first frozen and then highly heated before being used to blow the flame. With the introduction of the Gayley dry blast process most of the irregularities that affected B. F. production have disappeared, especially in the Pennsylvania iron-making region, where the quantity of moisture in the air is large and subject to great variation.

A modern large B. F. capable of producing 500 to 600 tons of pig iron daily is worth, with its equipment of railway tracks, storage rooms and bins, hot-blast stoves, blowing machines, dry-blast apparatus, equipment for cooling water, etc., over $500,000.

A by-product of the B. F. is gas that is drawn off from the top of the furnace and conducted to gas-engines which are made to furnish power for blowing or other operations about the plant. These engines are now often of great size. See Gas Engines. The blowing engines are also of enormous size, with cylinders up to 100 inches in diameter, of 1800 h. p., and a capacity of 50,000 cubic feet of air a minute, delivered at a pressure of 15 to 25 pounds. See Blowing Machines.

More B. F. are operated in the United States than in any other country for the production of pig iron. Rapid driving has also been developed here, the foreign B. F. being much slower in operation though increasing production by following American practice. In 1875 the average American B. F. produced only about 6,000 tons a year; in 1880 9,000 tons. By attention to details, and the system of driving, this was increased to 45,000 tons by 1895. In 1906 the average capacity was 75,000 tons a year, and less than 400 B. F. operated in the United States in that year produced over 25,000,000 tons of pig iron. Among the details of construction which have made pos-

sible the large increase in production of American B. F. may be mentioned: 1, cooling bosh-walls with circulating water; 2, improving and protecting the walls and the hearth with more refractory (that is heat-resisting) material, as bricks made with a mixture of carbon; 3, using hot dry air for the blast; 4, improving charging cars, to operate automatically to supply the ore and coke; 5, study of the chemical analysis of the flux, fuel and slag. See IRON, and SLAG.

BLASTING: separating stones, etc., from their beds, or breaking them in pieces, by the use of explosives. Before gunpowder was invented, the separation of masses of stone from their native rock could be effected only by means of the hammer and wedge, or by the still slower method of fire and water. In soft and stratified rock, wedges are still used for quarrying stones for building purposes; but in hard rock, or where regularity of fracture is no object, gunpowder or dynamite is ordinarily employed. There are two kinds of B.—first, the small-shot system; and second, that of large blasts or 'mines.'

The small-shot system consists of boring holes into the rock, of from one to six inches in diameter, and of various depths, according to circumstances. In hard rock, this is done by a steel-pointed drill, struck by a hammer, and turned partly round after each blow, to make the hole cylindrical. The addition of a little water preserves the temper of the boring tool, and makes the rock more easy to cut. In soft rock, whenever the hole is to be vertical, a 'jumper' is used; this is a weighted drill, which acts merely by its own weight, when let fall from about a foot in height. The powdered stone is removed at intervals by a 'scraper.' The rate of progress varies, of course, with the hardness, of the rock. After the hole is bored, it is cleaned out, and the explosive put in. When it is desirable to prevent the stones from flying about when the shot is fired a shield of boiler-plate, or of brush-wood weighted, may be laid over the hole.

When a large mass of rock has to be removed at once, or where a steady supply of irregularly broken stone has to be furnished daily, recourse is had to large blasts or 'mines.' The shaft holes, in which the charge of powder or dynamite is placed are many feet in depth. A notable example of great blasting operations was the removal of the reefs from the channel of the East River at Hell Gate. See HELL GATE.

Important improvements have been made in blasting by the substitution of rock-boring machines for hand labor; by these machines the drill is driven against the rocks by compressed air or steam, being made also to rotate slightly at each blow. Another important improvement is the firing of the charge by electricity, a method particularly adapted to submarine blasting.

Gun cotton (q.v.) and nitro-glycerine (q.v.) are used for blasting to some extent, but the latter requires great caution as it is liable to explode unexpectedly. Dynamite,

however, which is quite as effective is harmless when properly handled and is much more widely used. See also TUNNEL.

BLASTOCOLLA, n. *blăs'tō-kŏl'lă* [Gr. *blastos*, a bud; *kolla*, glue]: in *bot.*, a gummy substance coating buds.

BLASTODERM, n. *blăs'tō-dėrm* [Gr. *blastos*, a bud; *derma*, a skin]: the outer surface of the embryo in its earliest condition; the germinal disc or primitive layer of cells which forms on the egg in the early stage of incubation. BLAS'TODERMIC, a. *-mĭk*, pertaining to. See EMBRYO.

BLASTOIDEA, n. plu. *blăs-toy'dĕ-ă* [Gr. *blastos*, a bud; *eidos*, resemblance]: an extinct order of Echinodermata. BLASTOSTYLE, n. *blas'tŏ-stīl* [Gr. *stulos*, a column]: certain columniform zooids in the *Hydrozoa* which are destined to bear generative buds.

BLATANT, a. *blā'tănt* [Dut. *blaet*, a boaster: probably only a formation of BLEAT: compare Gael. *blor*, a loud noise]: bellowing as a beast. BLATTER, v. *blăt'tėr*, to make a senseless noise; to prate. BLATTEROON, n. *blăt'ėr-ôn* [prob. L. *blatero*, n., a blatterer]: a senseless babbler.

BLATCHFORD, *blăch'ford*, SAMUEL: jurist: 1820, Mar. 9—1893, July 7; b. New York; son of Richard Milford B. (1798–1875). He graduated at Columbia College 1837, and was private sec. to Gov. Seward 1839–43; was admitted to the bar 1842; and practiced at Auburn, N. Y., 1845–54, in partnership with William H. Seward and C. Morgan. He returned to New York 1854, having for partners C. A. Seward and B. W. Griswold; and there, besides the duties of a large practice, he prepared the reports of the U. S. circuit court for the second circuit, 1852, and with Mr. Howland those of admiralty cases in the U. S. dist. court for the s. dist., 1855. He was appointed to this bench 1867, May, and to that of the U. S. circuit court 1878, Mar. 4. His decisions have rarely been reversed. In admiralty and patent cases his opinions carried great weight, and the practice in extradition cases has been largely fixed by his decisions. He became an associate justice of the U. S. supreme court 1882, March. Here he continued to give close attention to admiralty cases, and also rendered important decisions on bankruptcy, copyright, patent, and libel causes. Publications: *Reports of Cases in Prize in the Circuit and District Courts for the Southern District of New York* 1861–5 (1866); *Reports of Cases in the Circuit Court of the United States, Volumes* 4–6 (1867–9); *Circuit Court Reports for the Second Circuit*, 1847–75 (12 vols. octavo); *Reports of the Circuit Courts of the United States, Second Circuit, Volumes* 13–20 (N. Y. 1877–83, 8 vols.); with F. Howland and E. R. Olcott, *United States District Court Reports* (*Admiralty Cases Decided by Judge Betts*) *for the Southern District of New York*, 1827–47 (N. Y., 2 vols. octavo).

BLATCHLEY, *blăch'lĭ*, WILLIS STANLEY, naturalist:

b. Madison, Conn., 1859, Oct. 6. He graduated at Indiana State University 1887, and was successively an assistant on the Arkansas Geological Survey 1889–90, a member of Scoville's scientific expedition to Mexico 1891, and assistant on the United States Fish Commission in 1893. In 1894 he was elected State geologist of Indiana, and re-elected 1898 and 1902. Besides his annual reports his scientific writings include: *Gleanings from Nature* (1899); *Locustidæ and Blattidæ of Indiana* (1892); *Some Indiana Acrididæ* (1891–8); *Descriptions of New Species of Orthoptera*; and *A Nature Wooing* (1902).

BLATHERSKITE [U. S., low]: a blustering, talkative fellow.

BLATTA: see COCKROACH.

BLATTER, v. *blăt'tėr:* to patter; to prate.

BLAT'TIDÆ: see COCKROACH.

BLAUBOK, *blow'bŏk*, a large antelope of South Africa (*Hippotragus niger*). It is of a bluish hue, and has long, stout horns which sweep back from its forehead like those of its relatives, the isabel and equine antelopes. It formerly occurred in large herds, but had a limited habitat, and is now probably extinct.

BLAUVELT, *blow'vĕlt*, MME. LILLIAN EVANS (Mrs. WM. F. PENDLETON), prima donna: b. Brooklyn, N. Y., 1873, March 16, of Welsh and Dutch ancestry. When eight years old she made her début as a violinist. She studied (voice) with M. Jacque Bouhy, of Paris, for three years. Her début in opera was made at the Theatre de la Mormari, Brussels, and she has taken the principal rôles in *Faust*, *Romeo and Juliet*, *Myna*, etc. Of late her work has been chiefly in concert and oratorio. Besides Great Britain, Canada, and the United States, she has sung in Russia, Germany, France, Italy, Holland, Belgium, Austria-Hungary, and Switzerland. In 1898 she sang before Queen Margherita in Italy; before Queen Victoria, June 1899; at Handel Festival, Crystal Palace, London, June 1900; and in 1903 at Royal Covent Garden, London, her principal rôles being *Marguerite*, *Faust*, *Micaela*, *Juliette*, *Romeo and Juliet*, *Zerline*, *Don Giovanni*, etc.

BLAVATSKY, *bla-vâts'kĕ*, HELEN PETROVNA; theosophist: 1831–1891, May 8; b. Russia; widow of Gen. Nicephore V. Blavatsky, at one time gov. of Armenia. After 7 years in India, she came to the United States, and formed a theosophical soc. 1875 (Col. F. P. Olcott pres.), its professed object being to promote universal brotherhood, study Aryan literature and religion, and investigate the mysteries of nature and man. She returned to India, and, by her influence and that of Col. Olcott, numerous branches of the soc. have been established there. By some she was deemed to be a secret agent of the Russian govt.; not a few Englishmen, however, have favored her doctrines, which seem a vague mixture of mysticism and spiritualism. In 1885–6 the wonders that she claimed

to perform, such as the transportation of letters by spiritual agency, were by investigators declared to be tricks; and the letters that she claimed to procure from Tibetan mahatmas, living and dead, were pronounced to be forgeries. B. edited *The Theosophist*, published in India; in 1877 she published a book, *Isis Unveiled: a Master-Key to the Mysteries of Ancient and Modern Science and Theology*. Her *Memoirs* were put forth by A. P. Sinnett, 1886. An article from Mme. B. (*N. Amer. Rev.*, Aug., 1890) reports more than 200 branch societies, with 7 centres of publication—Madras (headquarters), Bombay, Ceylon, Stockholm, London, Paris, and New York; in Ceylon, 50 minor schools taken under supervision, and the government induced to recognize Buddha's birthday as a public holiday; in India, the pandit schools of Sanskrit literature and philosophy revived, and a library of 3,046 oriental works collected.

BLAYE, *blā* (ancient *Blavia*): fortified seaport, France, dept, of the Gironde, 20 m. n.n.w. of Bordeaux. It is on right bank of the river Gironde, at this point about 2½ m. in breadth, at the base of a rocky eminence crowned with a strong citadel. The town is further defended by the two forts of Paté and Médoc, which command the passage of the river. The port of B. is a very busy one, all inward vessels being required to anchor and deliver the manifests of their cargoes; and many outward-bound vessels lay in their provisions here. B. has manufactures of linen and woolen, glass and earthenware; considerable export trade in corn, wine, brandy, oil, fruits, soap, etc., and tribunals of jurisdiction and of commerce. Pop., exclusive of garrison, 4,340.

BLAZE, n. *blāz* [AS. *blase* or *blæse*, a torch or lamp: Icel. *blossi*, a flame; *blys*, a torch: comp. Gael. *blathas*, warmth, heat]: the strong flame of any burning body; the full light of day: V. to flame; to shine with flame; to send forth light. Bla'zing, imp. Blazed, pp. *blāzd*.—Syn. of 'blaze, n.': fire; flame; conflagration; ignition; combustion.

BLAZE, n. *blāz* [Dut. *blesse*, a white streak on the forehead; Ger. *blässe:* Dan. *blis*]: the white mark on the face of an animal; a white mark on a tree when a part of the bark is stripped off.

BLAZE, *v. blāz* [AS. *blæsan;* Dut. *blaesen*, to blow. Icel. *blása*, to blow, to blow a trumpet]: to blow abroad; to spread news; to publish. Bla'zing, imp. Blazed, pp. *blāzd*. Bla'zingly, ad. *-lĭ*.

BLAZ'ING-STAR: familiar name in the United States for several very different plants; e.g. *Aletris farinosa*, called also colic-root; *Chamælirium lū'tĕūm anum* (star-wort); and two species of *Liatris*, viz., *scariosa* and *squamosa*. In *heraldry*, a comet used as a bearing, represented by a six-pointed star with a tail.

BLAZON, v. *blā'zn* [F. *blason*, a coat of arms: Sp.

blason, honor, glory; *blasonar*, to boast, to blazon—from M.H.G. *blásen*, to blow; *blásá*, a trumpet: AS. *blæse*, a flame, splendor]: to portray armorial bearings in their proper colors; to deck; to embellish; to adorn: N. show; pompous display. BLA′ZONING, imp. BLAZONED, pp. *blā′znd:* ADJ. ornamented with a blazon. BLA′ZONMENT, n. BLA′ZONER, n. one who. BLAZONRY, n. *blā′zn-rĭ*, that branch of heraldry which describes or explains coats of arms in proper terms; the art of delineating the figures and devices of a coat of arms in their proper colors or metals.

BLAZON, v. *blā′zn* [OE. *blasen:* a corruption of BLAZE 3, which see]: to make known far and wide; to make public by words or writing; to proclaim: N. in *OE.*, a proclamation; a trumpeting forth.—BLA′ZONER, n. *-zn-ėr*, one who blazes abroad. *Note.*—The two preceding entries are closely connected.

BLA′ZON—BLA′ZONRY: heraldic terms, originating in the custom of blowing a trumpet to announce the arrival of a knight, or his entrance into the lists at a joust or tournament. The blast was answered by the heralds, who described aloud and explained the arms borne by the knight. B. and B. thus came to signify the art of describing, in technical terms, the objects (or charges, as they are called) borne in arms—their positions, gestures, tinctures, etc., and the manner of arranging them on the shield.

Rules of Blazoning.—As heraldry, though an entirely arbitrary, is a very accurate science, the rules of blazoning are observed on all occasions with the most rigid precision. The following are the most important: 1. In blazoning or describing a coat of arms, it is necessary to begin with the field, mentioning the lines by which it is divided—*per pale, per fess*, etc., if such there be—and noticing if they are *indented, engrailed*, or the like, it being taken for granted that they are straight, unless the contrary be mentioned. 2. There must be no unnecessary repetition in blazoning; thus, where the field is blue, and the charges yellow, the proper words are, *azure, a crescent between three stars, or*, thereby implying that both the crescent and the stars are *or*. 3. For the same reason, where a color has been already mentioned, and it is necessary, in order to avoid ambiguity, to repeat it in describing a subsequent charge, it must be said, *of the first*, or *of the second*, as the case may be; thus, *azure, on a saltire argent, three water bougets of the first;* avoiding the repetition of the word azure. 4. Again, recurring to the first example, it would be an error to say, *three stars with a crescent between them*, because B. must always begin with the charge which lies nearest the centre of the shield. 5. Where the charges are of the natural color of the objects or animals represented, in place of describing the color, it is simply said, *proper*—i.e., of the proper or natural color. 6. Another general rule in blazoning, or rather in marshalling coat-armor, is,

that *metal shall never be placed upon metal, nor color upon color*, i.e., of the proper or natural color.

For the rules for blazoning separate charges, whether animate or inanimate, see the titles of the respective charges: also ORDINARIES: BAR: BEND: ETC.

BLEACH, v. *blēch* [AS. *blæcan*—from *blæc*, pale: Dut. *blaken;* Icel. *bleikr*, light-colored; *bleikja*, to bleach (see BLACK)]: to make white by exposure to sun and air; to make white by chemical means; to take out color; to grow white in any way. BLEACHING, imp.: N. the art of making anything white, especially cloth. BLEACHED, pp. *blēcht.* BLEACH'ER, n. one who. BLEACH'ERY, n. *-ėr-ĭ*, a place for bleaching. BLEACHING-POWDER, a salt of lime, being a mixture of the chloride and the hypochlorite. See HYPOCHLOROUS ACID.

BLEACHING: process of whitening or decolorizing any substance; generally understood of whitening or decolorizing cloth. Until about the close of the 18th c., B. depended upon the natural bleaching agencies present in the atmosphere and in the sun's rays. The usual plan was to spread out the cloth on a grass-field, called a bleaching-green, and to continue sprinkling it with water several times a day. After being thus exposed for several months to the action of air, light, and moisture, the cloth was rendered white. The process was necessarily tedious and occupied much valuable land, and for this reason much of the cloth required to be bleached was sent to Holland for that purpose. A particular kind of linen, regularly sent to Holland, received on that account the name of *Hollands;* and another variety of linen, which, from its fineness, was generally spread on the better grass-fields or lawns, received the title of *lawn.* An improvement in the preceding process was to dip the cloth occasionally in a weak *alkaline lye,* or solution of an alkali, such as soda in water, which step was called *bucking;* after which, the cloth was spread out on the grass for some weeks, and regularly moistened with water, this stage being styled *crofting;* the cloth was then soaked in sour milk and water, which was called *souring*, and again exposed on grass to the action of air and sunlight. By repeating the bucking, crofting, and souring operations several times, the bleaching was very much hastened, and the amount of land occupied in bleaching-greens lessened. The next improvement was the introduction of dilute sulphuric acid instead of sour milk, as the souring agent; and this was so effectual, that it lessened the time required for B. from about eight months, which was the original time, to about four months.

Formerly it was thought that the agent in this natural mode of B. was entirely resident in the sun's rays; but an active agency is now attributed also to the substance called Ozone (q.v.), now thought to be an allotropic form of oxygen, which possesses very powerful B. properties, and which in greatly varying proportions exists in the atmosphere.

In the year 1785, Berthollet, French chemist, discovered

the powerful B. properties of *Chlorine* (q.v.), which destroys color by uniting with the oxygen of the coloring principle, so decomposing the color. At first, the gas chlorine was employed for bleaching cloth; then a solution of chlorine; but as these were found either difficult of proper application or liable to injure the fabric, chlorine gas was applied to dry, slaked lime, producing a *B. powder* commonly called *chloride of lime*, though its exact nature is not certainly known (see HYPOCHLOROUS ACID). It is not serviceable in the destruction of the color of wool, silk, or the oils and fats; such materials being bleached by the milder sulphurous acid.

BLEACHING OF COTTON AND LINEN FABRICS.—B. of linen is a much longer process than B. of cotton, as its fibre holds more impurities: linen in B. is said to lose one-third of its weight; cotton about one-twentieth.—The substances of which riddance is required in the purification of cotton and linen cloth, are (1) the organic coloring matter naturally present in the fibre; (2) resinous and fatty bodies, also inherent in the fibre; (3) weavers' dressing and perspiration taken up during the process of spinning; and (4) certain saline or earthy substances. The B. process varies in details; but in its general principles it is as follows. For linen, the chemical solutions used are weaker. The *first stage* in the B. is the singeing of the cloth, drawing it rapidly over a red-hot iron cylinder, or a series of gas jets, which burn off the minute particles of fibre, leaving the cloth smooth. The *second stage* is the washing or scouring of the cloth in a large vat of lukewarm water, and then washing it, by a machine, in pure water. The *third stage* is boiling with lime-water, or *bucking* in a *Bucking Keir*, an apparatus consisting of two great cylinders connected by steam valves, by which the lime-water is forced alternately up and down through the cloth for about eight hours. Carbonate of soda is often mixed with the lime. The chemical action of the boiling lye on the cloth is in the formation of a soap with the resinous and fatty substances in the cotton or linen fibre. The cloth is afterward washed in pure water by a machine. The *fourth stage* in B. is the *souring* in dilute sulphuric acid, one gallon of the acid to 25 to 30 gallons of water: the cloth is first steeped in this liquid; then usually washed in water and bucked in soda-lye, and again washed. The *fifth stage* is *chemicking with B. liquor*, obtained by dissolving *B. powder* (q.v.) in water in which the cloth is steeped about six hours; then soaked about six hours in a second vat of water, after which it is exposed to the atmosphere. The *sixth stage* is another *souring* process for about four hours in a steeping vat of dilute sulphuric acid, 1 to 8 gallons of acid in 200 gallons of water: the acid, combining with the lime of the B. liquid in the cloth, liberates the chlorine, which attacks the remaining traces of color and removes them. The cloth is then boiled with soda-lye, washed, and again treated with dilute sulphuric arcid; is thereafter thoroughly washed,

and passed through rollers to remove some of the water; then introduced into the *hydro-extractor* for full riddance of the water; and lastly dried by being suspended in the air, or by being passed over a series of heated tin rollers, called *steam cans*.

After the B. process, there is usually the *finishing* of the cloth, by use of a mangle or calender, giving a fine glazed surface; but cloth to be printed on, or to be dyed, is not starched or calendered.—The operations of B. by chlorine require for cotton 2 to 4 days; for linen scarcely less than 2 weeks. The chlorine process has a certain weakening effect on the cloth. Grass-B. is therefore still in use where time admits, as also for clearing linen and cotton apparel in domestic washing. See WASHING.

BLEACHING OF WOOL is not done by B. powder, which would destroy the fabric, but by sulphurous acid, which disguises the color of the wool by combining with it to form a colorless compound. Natural wool is coated with a complex fatty substance partially saponified, called the *yolk*. The *first stage* in the B. is for riddance of the yolk, usually by steeping the wool in dilute alkaline carbonates, and stale urine (or for woolen cloth, carbonate of soda); followed by washing. The *second stage* is the *sulphuring*, effected by fumes of burning sulphur (sulphurous anhydride) in a close chamber; or by applying sulphurous acid in strong aqueous solutions: the sulphuring is the actual B. or whitening process. But wool to be dyed of dark color is not thus bleached, but only scoured. After about 24 hours of sulphuring the B. is finished, and the cloth is then thoroughly washed. The sulphurous acid does not *destroy* the color, but only masks it in a transiently colorless compound from which the color can be revived by soaking the wool in a dilute acid or in a dilute alkali. Hence, new woolen cloth, flannel, etc., almost colorless when purchased, after several washings return to their natural yellow; for the soda used, or the soap, resuscitates the original color.

BLEACHING OF SILK is similar to B. of wool. The silk has naturally nearly half its weight of a waxy substance with a little coloring matter, enveloping the fibre; and the silk stuffs are first put through an ungumming process by steeping in very dilute hydrochloric acid; then they are boiled with much care in a strong solution of olive-oil soap (if to be white) or of oleic acid soap (if to be dyed); the alkaline nature of the solution being occasionally tempered by admixture of bran, which contains an acid. For pure white, or for very light printing, the silk is finally exposed to the action of sulphurous acid gas.

Recently the B. of silk has been improved by the use of peroxide of hydrogen—suggested by William Crookes. After cleansing and the complete removal of the cleansing agents, the silks are simply laid in a B. bath made of peroxide of hydrogen, with which may be very minute quantities of ammonia or of soda-lye. Heat, not above 77° F., and sunlight hasten the B. process, which may occupy 2–14

days. This process may be used also in B. of furs, hair, feathers and leather; flax and jute can be bleached in one or two days. Also it is very successful in B. of wood for ornamental purposes. Since 1887 a B.-bath of peroxide of hydrogen has been prepared from the dry powder of peroxide of barium with an acid and certain salts.

For the B. action of charcoal on organic coloring matters in solution, see BONE-BLACK.

Other substances employed in the arts and manufactures are subjected to bleaching, as the rags in the manufacture of PAPER (q.v.), the palm oil to be converted into CANDLES (q.v.), and the STRAW (q.v.) for hats or bonnets: see details of these and other processes, under the respective titles.

BLEACHING POWDER: a combination of chlorine and dry slaked lime (see BLEACHING); manufactured on a large scale first in Glasgow, Scotland, under patent obtained by Charles Tennant 1799.

In the preparation of B. P. dry slaked lime is spread on the floor of a stone or lead-lined chamber in a thin layer, not more than six inches in depth, and chlorine gas is then admitted to the chamber and allowed to act upon the lime. The chlorine is rapidly absorbed by the lime, which, when the absorption flags, is stirred from time to time by wooden rakes. The process must not be allowed to proceed too quickly, as much heat is evolved during the combination of the chlorine with the lime; and if the temperature of the chamber rises beyond 110° F., the power of combination is very much lessened. The chemical changes involved are not definitely known, but the resulting B. P. is a hypochlorite of calcium ($CaCl_2O_2$) with a variable proportion of chloride of calcium ($CaCl_2$), and uncombined lime. The chlorine used in the manufacture of B. P. was formerly produced largely by heating manganese dioxide with the hydrochloric acid obtained as a by-product in the manufacture of soda from common salt. The tendency in recent times has been toward the more direct manufacture of soda by the electrolysis of a solution of salt in water. Free chlorine gas is given off at the anode during this electrolytic process, and is now utilized for the preparation of B. P. This method is followed by the large works at Niagara Falls which supply the U. S. with most of its soda and B. P. B. P. is a powder, white or nearly so with a strong odor like that of chlorine. See SODA, MANUFACTURE OF: MANGANESE: also HYDROCHLORIC ACID: HYPOCHLOROUS ACID. When freshly manufactured it contains about 37 per cent. of chlorine. Its manufacture is one of the leading chemical industries.

BLEAK, a. *blēk* [AS. *blæc*, black: Ger. *bleich;* Dut. *bleek*, pale: Icel. *bleikr*, pale, wan]: cold; open; exposed; cheerless; solitary: N. a fresh-water fish, so named from its pale color, and whose scales are used in making artificial pearls. BLEAK'ISH, a. cheerless and open in a certain

degree. BLEAKY, a. *blēk'ĭ*, cold; chill. BLEAK'LY, ad. *-lĭ*. BLEAK'NESS, n. the quality of being bleak; exposure to cold and wind.

BLEAK (*Leuciscus Alburnus*): small fresh-water fish of the family of *Cyprinidæ* (q.v.), of a genus-name which, in N. Amer., we retain only in a tribe, *Leuciscinæ*. It is not more than six or seven inches long; in general form it resembles the dace, but more elongated; the dorsal fin is further back, and the base of the anal fin is longer; the nose is pointed, the under jaw the longest; the scales are of moderate size, and beautifully striated; the back is of an olivaceous green color; the sides, belly, cheeks, and gill-covers shining silvery white; all the fins nearly white. The tail is forked for half its length. The B. is found in many of the rivers of Europe. On the inner surface of the scales of the B., as of white-bait, roach, dace, etc., a silvery substance, from which they derive their beautiful lustre, is found in such abundance as to be much used for making artificial pearls (q.v.). That obtained from the scales of the B. is preferred to that of the roach and dace, but is inferior to that of the white-bait. The B. is singularly liable to be infested by a species of tape-worm.

The B. is a very restless, active little fish, constantly playing about the top of the water, in search of small flies or other food. A small piece of bread cast into the water becomes speedily surrounded by a shoal of them darting to and fro at it. It is esteemed as delicate food, and is cooked in the same manner as sprats. The best way to catch B. is to angle for them with a single gentle and a light quill-float, the bait being about a foot under water; they may be caught with very small flies, and all the more easily, if the hook be pointed with a gentle. They are so active, that the angler cannot strike too quickly, and where they abound they form good preliminary practice for the young fly-fisher. The neighborhood of running drains is a favorite resort for B. and the angler can soon determine if there be any about, by casting on the water a handful of bran, when, if there be any, they will immediately rise at it.

BLEAR, a. *blēr* [Dan. *blære*, a blister: Low Ger. *blarren*, to cry or weep—hence, *blair-oge*, a red watery eye: prov. Sw. *plira* to blink]: sore, watery, and tender in the eye: V. to make sore and tender; to blur; to dim. BLEAR'ING, imp. BLEARED, pp. *blērd*. BLEAR'EDNESS, n. state of one whose eyes are blear. BLEAR-EYED, having sore eyes; dim-sighted. BLEAR'NESS, n. soreness of the eyes. TO BLEAR ONE'S EYES, in *OE.*, to dim one's eyes; to deceive.

BLEAT, n. *blēt* [an imitative word: Dut. *blaten;* Ger. *blöken*, to bleat as a sheep]: the cry of a sheep: V. to cry as a sheep. BLEAT'ING, imp.: N. the cry of lambs or sheep. BLEAT'ED, pp.

BLEB, n. *blĕb* [an imitative word: Gael. *plub*, a round lump, a drop; allied to *bulb*—Lat. *bulla*, a bubble]: a drop

of water; a blister; a vesicle; name applied to transparent bladders or blisters of the cuticle, appearing in some forms of fever, in erysipelas, and in disorders of the digestive apparatus. There are three varieties of B. recognized by physicians: 1. The mild B., which vary in size from a pea to a hazel-nut, occur on the face, neck or arms, and legs of teething infants, and of young persons who have indulged in unripe fruit. They generally burst, discharge the clear fluid they contain, and heal up again in three of four days. 2. The tedious B., which most commonly affect aged and weakly persons, are seen as an eruption of numerous red elevations, which enlarge to the size of a pea, containing pale yellow serous fluid. These vesicles multiply to such an extent that the sufferer is disturbed at night from the irritation, and slight febrile attacks further debilitate him. 3. The solitary bleb generally selects old women for its victims, and appears after much tingling of the skin, as one large vesication, and bursts in 48 hours, leaving a superficial sore.

The treatment consists in correcting the secretions, limiting the diet to what is farinaceous and easy of digestion, cooling drinks and tonics. For local treatment, the irritated surfaces are to be soothed by poultices and water-dressings.

BLECHEN, *blĕch'ĕn*, Karl Eduard, German landscape artist: b. Kottbus, 1798; d. 1840. After studying art in Italy for some years he settled in Berlin in 1830 and became professor at the Academy of Fine Arts there in 1835. The first representative of the Berlin landscape school, he painted *Villa Este; Villa Borghese; View Near Nami; View of Naples; View at Tivoli;* etc.

BLEDSOE, *blĕd'sō*, Albert Taylor, ll.d.: 1809, Nov. 9—1877, Dec. 8: b. Frankfort, Ky.; d. Alexandria, Va.: West Point graduate, 1830, then lieut. Seventh Infantry till 1832; assistant prof. of mathematics in Kenyon College, 1834; rector of Prot. Episc. Church, Hamilton, O., and prof. of mathematics in Miami Univ., 1835–36; practiced law in Springfield, Ill., and in the supreme court at Washington, 1840–48; became prof. of mathematics in the Univ. of Mississippi, 1848, then in the Univ. of Virginia, 1854. Afterward a colonel in the Confederate service, he was soon made asst. sec. of war. In 1867, he began to publish *The Southern Review.* In 1871 he became a Methodist, and preached occasionally. He has published several theological works and political essays, and a *Philosophy of Mathematics.*

BLEED, v. *blēd* [AS. *bledan* (see Blood)]: to lose blood by any means; to draw blood; to run sap from a tree. Bleed'ing, imp.: N. a flow of blood; operation of letting blood; hemorrhage: Adj. flowing with blood or juice. Bled, pp. *blĕd.* Bleed'er, n. one who bleeds.

BLEEDER: see Hæmophilia.

BLEEDING (*hemorrhage*): one of the most serious

accidents which can happen to an animal, and giving rise to a grave complication in surgical operations. As there is but a limited quantity of blood in the body, and as the sudden escape of a large portion of it may cause death, every one should be instructed as to the measures most efficient for preventing a dangerous loss of blood. B. may be either from a wounded artery or vein, or from a raw surface; and it may be in the form of a general oozing from the surface of a sore or a mucous membrane.

Arterial B. is recognized by the florid redness of the blood, and by its issuing from the cut vessel *per saltum* or by jerks. There are exceptions to this, however. When an artery has been tied, and bleeding occurs from below the ligature, the flow of blood is continuous, and of a dark color.

If a large artery be wounded, the first gush of blood may prove fatal, but in general the patient faints, and nature takes advantage of the fact that the blood is no longer impelled vigorously by the heart to form clots between the cut end and the cellular tissue surrounding it; the inner and middle coats of the artery not only *re*tract but *con*tract, and another clot forms within the arterial tube. These clots—which, with the faintness and the contraction and retraction of the artery, are termed natural *hemostatics* (blood-stoppers)—are sufficient in many cases to prevent a recurrence of the B.; but such a happy concurrence is not to be depended on, and one should adopt some of the many surgical or artificial means for restraining the flow of blood. The principal surgical means are:

Immediate pressure, which may be applied by pressing the finger-tip on the place whence the blood is seen to flow, and may be kept up by pads of lint, or a coin of convenient size wrapped in cloth, and secured with a bandage to the part.

Pressure on the artery above the cut part. This requires some knowledge of anatomy, but not more than any intelligent person may easily acquire. Thus, pressure on the inside of the arm, about midway between its front and back, will press the brachial artery (q.v.) against the bone, and arrest any bleeding from wounds of the forearm and hand. Pressure on the middle of the groin with a thumb placed crosswise will control the stream of blood in the femoral artery, so that none can escape from any wound below where the pressure is made. Pressure on the course of the vessel may be very efficiently effected by tying a handkerchief round the limb above where it is injured, and then inserting a stick, and twisting it sufficiently tight. This is the principle of the original *tourniquet* (q.v.). The objections to *pressure* as a means of arresting hemorrhage are, that it is usually painful, that it includes the vein, and thereby engorges the limb with blood, and that it may cause mortification, if long continued.

The *actual cautery*, or hot iron, is occasionally useful

in bleeding from a bone, or at some points where pressure cannot be efficiently applied. It is the oldest method of stopping bleeding, and until the 18th c. was much in use. If used, the iron should be at white heat and should be held in contact with the bleeding vessel for a moment. It causes an eschar or slough, with shrivelling of the artery; and if the latter be small, it effectually stops the bleeding, until the eschar drops off, when the vessel may be found still pervious at the wounded part, and the danger of bleeding be as great as at first. Instead of the hot iron the Paquelin or the *electric cautery* is now employed; but the method is little used now.

Ligature, or tying the artery, is a very old method of arresting hemorrhage, and is certainly the best. It requires surgical knowledge and skill, as it is not available in 'first aid' treatment. See LIGATURE. Another method was introduced by Sir James Y. Simpson of Edinburgh, and was termed by him Acupressure (q.v.), or pressure from a long needle or pin inserted from without, so as to press the artery between it and the tissues.

Venous B. is recognized by the dark color of the blood, and its continuous flow. Pressure is generally sufficient to arrest it, and it should be applied directly over the wounded part. If pressure be insufficient to stop the flow, the cut end should be seized with a pair of hemostatic forceps and tied with cat-gut, using every antiseptic precaution to prevent infection of the wound.

Oozing from cut surfaces of course partakes of the characters of venous and arterial B., but there is no vessel sufficiently large to demand a ligature. Pressure, the actual cautery, and cold may then be used, or one of the many styptics, such as the strong perchloride of iron applied on lint or a sponge; or astringents, such as alum and tannin; there are also the puff-ball, cobwebs, felt, etc., which act mechanically. As the latter are usually dirty, containing germs of suppuration if not of tetanus, their use is not to be recommended, especially as they owe their reputation chiefly to the pressure used in their application, and this pressure can be made as well in other ways.

B. from the free surfaces of mucous membranes occurs when they are much congested. One may have fatal hemorrhage from the stomach, and yet no open vessel may be found after death, even on the most careful examination. In such a case, resort must be had to cold and internal remedies, such at tannic acid combined with opium.

BLEEDING OR BLOODLETTING.—Blood may be drawn from a vein (phlebotomy—venesection) or from an artery (arteriotomy). The veins usually opened for this purpose are those at the bend of the elbow (see ARM), but those of the lower limbs are occasionally selected.

Phlebotomy was at one period habitually resorted to in inflammatory diseases, or such as were thought so; and even when there was no positive disease, it was often applied periodically at particular seasons, as spring and

autumn, as a hygienic precaution; but it is now seldom resorted to except in certain emergencies. Local B. is effected by cupping and leeches. See articles on these; and VENESECTION.

Arteriotomy is performed usually on the temporal artery, by a transverse cut about half-way through the vessel. When the required amount of blood has been abstracted, the vessel is completely cut across, to allow of its ends retracting and healing. If this precaution is neglected, an Aneurysm (q.v.) may form. A compress and bandage should be put on the head for a day or two.

BLEEK, *blāk*, FRIEDRICH: 1793, July 4—1859, Feb. 27; b. Ahrnesbök, in Holstein: distinguished German biblical critic and exegete; educated at the gymnasium at Lübeck, the University of Kiel, and in Berlin under De Wette, Neander, and Schleiermacher; in 1818, tutor in theology at Berlin, soon publishing noteworthy essays on the *Sibylline Oracles* and on the *Book of Daniel;* after three years lost his position on account of unfounded suspicions; in 1823, extraordinary prof. at Berlin; in 1829, prof. of theology at Bonn, where for 30 years he attracted students to his lectures, by his thorough investigation, impartial judgment, and clear presentation; in 1843, consistorial councilor and rector of the university. He died suddenly of apoplexy. Of the 'advanced' school in his Old Testament criticism, he was yet conservative with respect to the New Testament. His defense of the genuineness of the Gospel by John is of much value. His greatest work, *Commentary on the Epistle to the Hebrews*, is commended by De Wette and Delitzsch as one of the best.

BLEIBERG, *blī'bĕrg:* town of Austria, province of Carinthia, in the circle of, and about 8 m. w. of Villach; pleasantly situated in the valley of the Drau, or Drave, near the celebrated Bleiberg (Lead Mountain). The people are engaged chiefly in the mines of the Bleiberg—from which, 1,500–1,800 tons of lead are annually obtained—and in washing and smelting the ore. Pop. 5,000.

BLEMISH, n. *blĕm'ĭsh* [OF. *blesmir*, to soil or spot, to make livid with blows—from *blesme*, pale, wan: Icel. *blami*, the livid color of a bruise]: a soil or spot; and defect; any mark or scar that lessens the beauty and proportion; deformity; imperfection in character: V. to impair or injure; to tarnish. BLEM'ISHING, imp. BLEM'ISHED, pp. *-ĭsht.* BLEM'ISHABLE, a. *-ă-bl.* BLEM'ISHLESS, a. without blemish. BLEM'ISHER, n. one who.—SYN. of 'blemish, n.': defect; flaw; fault; spot; speck; deformity stain; taint; reproach; disgrace; imputation; dishonor.

BLEMYES, or BLEMMYES, *blem'mĭ-ēz*: a race represented by some ancient writers as fabulous, but known to have lived in Africa in historic times, and supposed to be ancestors of the modern Bishareen, Ababdeh, and other tribes. They were nomadic, ranging over an unknown extent of territory, and occupying different regions

at different periods. In Ptolemy's time they lived between what are the modern Bahr-el-Azrek and Atbara—earlier referred to as extending beyond the Lybian desert. In the 2d c. they made inroads into the Roman province of Egypt. Later under powerful chiefs they obtained, by permission of Diocletian, possession of the Nubian territory, till then held by Rome. Even till the 7th c. they are known to have been making their hostile excursions.

BLENCH, v. *blĕnsh* [AS. *blencan*, to deceive: Icel. *blenkja*, to impose upon: same as BLINK, and probably FLINCH]: to shrink; to start back; to flinch; to give way: N. in *OE.*, a start.

BLEND, v. *blĕnd* [AS. *blendan*, to mix, to confuse: Dut. *blanssen*, to dabble in water; Icel. *blanda*, to mix: Dan. *blanda*, to mix one's self with]: to mingle together so as not to be able to separate; to confound. N. a mixture. BLENDING, imp.: N. in *painting*, so laying on different tints as to render it impossible to tell where one color begins and another ends. BLEND'ED, BLENT, pp. BLEND'ER, n. one who.

BLENDE, n. *blĕnd* [Ger. *blenden*, to dazzle]: a term applied to several minerals having a peculiar lustre or glimmer, variously colored, as hornblende, zincblende, etc., now generally restricted to the sulphide of zinc; the black-jack or mock ore of English miners. BLEND-OUS, a. *blĕn'dŭs*, relating to blende.

BLENDE: name given to a number of minerals composed chiefly of sulphur and of certain metals, all or almost all of splendid lustre, at least in fractures and on the faces of crystals. It is also often popularly applied exclusively to one of these minerals, to which alone, perhaps, it originally belonged, ZINZ B., or GARNET B.; called also, according to its chemical composition, *Sulphuret of Zinc*. Among English miners it is known as *Black Jack*. It is abundant both in primitive and in secondary rocks in many parts of the world, and is often associated with Galena (q.v.) or Lead-glance. It contains about 66 parts of zinc and 33 of sulphur, is used as an ore of zinc (q.v.); and is mined in Cornwall, Eng., and in various parts of the U. S. It is usually brown or black, sometimes red, yellow, or green. It occurs both massive and crystallized in rhomboidal dodecahedrons, octahedrons, and tetrahedrons. Macles, or twin crystals, are remarkably common. It is very brittle; before the blow-pipe, it decrepitates violently, but fuses only on thin edges.—MANGANESE B. is a rare mineral, composed of sulphur and manganese.—ANTIMONY B., or *Red Antimony*, also is a rare mineral, composed of sulphur and antimony.—RUBY B. is a name sometimes limited to Pyrargyrite, or Red Silver (see SILVER, ORES OF); sometimes extended as a sort of generic term to include a number of other minerals composed of sulphur and metals, among which are Cinnabar (q.v.), Realgar (q.v.), and Orpiment (q.v.).

BLÉNEAU, *blā-nō′:* village of France, dept. of the Yonne, about 29 m. w.s.w. of Auxerre, celebrated as the place where Turenne gained a victory over the Prince de Condé, 1652. Pop. abt. 2,000.

BLENHEIM, *blĕn′im* (Ger. *Blindheim*): village of Bavaria, 23 m. n.n.w. of Augsburg, memorable in connection with Marlborough's great victory over the French and Bavarians, 1704, Aug. 13. The battle, however, did not actually take place here, but at a village in the vicinity called Höchstädt, and is known to the Germans by that name. France and Bavaria, on the one hand, stood opposed to Holland, England, Austria, Savoy, Portugal, and the German empire on the other. The French and Bavarian army consisted of 56,000 men, commanded by Tallard, Marsin, and the Elector of Bavaria. Opposed to it was an army of 52,000 men, under the command of Marlborough and Prince Eugene. The French and Bavarian generals had no idea that the allies would act on the offensive, and accordingly, when, about two o'clock in the morning, Aug. 13, the line of the allies put itself in motion, they believed that it was about to retreat. Even at seven o'clock, when the heads of the eight columns advancing under Eugene and Marlborough became visible, Tallard regarded the whole proceeding as a stratagem to cover the retreat. When the mistake was discovered, the army was hastily drawn up in battle-array, and fought with dauntless courage; but at five in the afternoon Marlborough broke through the line of battle, and won a most decisive victory. The French and Bavarians left about 10,000 killed and wounded on the field, vast numbers were drowned in the Danube, and about 13,000 including Tallard, were taken prisoners, Altogether their loss was estimated at between 30,000 and 40,000; 120 pieces of cannon and 300 standards were captured. The loss of the victors amounted to about 5,000 killed and 8,000 wounded. Near to B., also, the French defeated the Austrians in 1800.

BLEN'HEIM DOG, or MARL'BOROUGH DOG: small and very beautiful variety of spaniel, much resembling the King Charles spaniel (q.v.) in form and general appearance but differing in the color, which is white, with orange or flame-colored markings. In weight it should not exceed five pounds. The B. spaniel is the *Pyrame* of Buffon. It derives its English name from Blenheim Palace in Oxfordshire, the seat of the Dukes of Marlborough, where the breed has been preserved since the beginning of the 18th c. These dogs are sometimes sold at an enormous price.

BLEN'HEIM HOUSE, near Oxford: seat of the Duke of Marlborough, erected at the public expense in the reign of Queen Anne as a testimony to the victor of Blenheim (q.v.). £500,000 was voted for the purpose, but that sum did not suffice for the completion of the work. The royal estate of Woodstock, in which it stands, was

granted at the same time. The building was designed by Sir John Vanbrugh, and is a grand, though heavy monument of his powers as an architect. The length of the principal front from wing to wing is 348 ft. The interior is proportionally magnificent; the collection of paintings was one of the most valuable in Britain. Among the objects of interest in the grounds are a triumphal arch, and a column 130 ft. high, surmounted by a statue of Marlborough. An inscription on the pedestal, by Bolingbroke, recites the public services of the hero. The manor of Blenheim Park embraces a circuit of about 12 m. The paintings, gems, books, etc., were sold 1875–86.

BLEN'NERHASSETT, Harman: 1764–1831; b. England; educated for the law in Ireland; sold his estates in Ireland for more than $100,000, came to the United States; built a fine residence on an island in the Ohio, below Parkersburg, Va., there dispensing elegant hospitality; became interested in Aaron Burr's scheme for seizing Mexico where Burr was to be emperor, B. a duke and ambassador to England; and spent large sums in fitting out an expedition. He was afterward arrested, but Burr's acquittal set him and all the suspects free. He returned bankrupt to Natchez and became a cotton planter; but commerce being destroyed by the war with England, he went to Montreal to practice law. To secure certain property he went in 1822 to Ireland, but failed in this and every other project. A sister supported him in his last years, and left a small estate to his wife and children. B.'s wife, daughter of Gov. Agnew, of the Isle of Man, was a woman of culture, author of *The Deserted Isle, The Widow and the Rock*, and other poems. After her husband's death, coming to the United States, she petitioned congress to repair her losses, but died before final action was taken. A son, Josephi Lewis, some time practiced law in Missouri. In 1864 were published *Blennerhassett Papers*, with a memoir.

BLENNORRHEA, n. *blĕn'ŏr-rē'ă* [Gr. *blennos*, mucus; *rheō*, I flow]: excessive flow or secretion from mucous glands in any situation; as the term does not well express the nature of such fluids, modern writers do not often make use of it. *Mucus* is a pellucid, ropy substance, which, according to Sir James Paget, has no corpuscles or organized particles of its own. In those discharges termed blennorrheal, on the other hand, there is a mixture of epithelial scales shed in large quantities from the mucous membrane (mucus cells), and occasionally pus cells. In B. of the lachrymal sac, or what is called 'watery eye,' if the inner corner of the eye be pressed by the fingers, an opaque, milky fluid will appear between the lids, instead of the transparent tears which are present when the lachrymal apparatus is in health. After inflammations of the genito-urinary mucous membrane, a gleety discharge frequently occurs, and continues for a long period. The treatment consists in establishing a robust state of health

by tonics and the preparations of iron, fresh air, and careful regimen, with astringent lotions applied directly to the mucous membrane, such as alum, tannin, etc., to lessen the quantity of the secretion, and occasional caustic stimulants, as the nitrate of silver, to alter the depraved condition of the secreting membrane.

BLENNY, n. *blĕn'nĭ* [Gr. *blenna*, mucus, slime], (*Blennius*), genus of a group of not valuable fish, which has 2 small e. U. S. species and many on the Pacific coast: belonging to the family Blennidæ. To the B. family, the Wolf-fish (q.v.) and the Gunnel (q.v.) or Butterfish are referred. The fishes of this family are generally remarkable for the abundance of slimy matter with which their skin is covered; whence their name. Many are destitute of scales. The body is generally of an elongated form. They have only one dorsal fin, which, however, seems in many of them as if composed of two parts. They are distributed in the seas of all parts of the world.—The true blennies are small fishes, living in shoals, which do not consist of great numbers, frequenting rocky coasts, and often found in pools left dry by the tide, or even among the wet sea-weeds, among which they are capable of subsisting for a much longer time than that of the absence of the tide. They possess the power of using their ventral fins to aid them in moving about among rocks and sea-weeds. They have a fringed appendage over each eye. They are seldom thought of as an article of food, but are in demand for the aquarium, on account of their tenacity of life and their activity. They feed chiefly on small crustaceans.—Many of the B. family retain their eggs within the oviduct until they are hatched, so that the young are produced alive, and capable of seeking food for themselves. An example of this is found in the Viviparous B. (*Zoarces vivipara*) of the British coasts.

BLÉRÉ, *blā-rā':* town in the dept. of the Indre-et-Loire, France; on the left bank of the Cher, here crossed by a bridge; said to owe its origin to Henry II. of England. It is about 15 m. e.s.e. of Tours. B. is the entrepôt for most of the traffic on the Cher. In its vicinity is the castle of Chenonceaux, the residence purchased by Henry II. of France for the celebrated Diana of Poitiers, who lavished much money on its embellishment, as did also Catharine de' Medici, after she had dispossessed Diana. In 1733, it became the property of M. Dupin, whose wife, by her beauty and wit, attracted to the castle almost all the distinguished literary and scientific men of that day, including Montesquieu, Voltaire, Fontenelle, Buffon, Bolingbroke, and Rousseau. The castle escaped the fury of the revolution, and is still in good preservation. Among the curiosities shown to the visitor is the mirror used by Mary Stuart (Queen of Scots) on her marriage with the Dauphin. Pop. abt. 4,000.

BLESS, v. *blĕs* [AS. *blessian* to rejoice; causal; to make glad]: to make holy by a prophetic benediction;

to set apart by consecration; to pronounce a solemn benediction; to prosper; to praise; to give thanks to; to glorify or praise for benefits received; to utter a wish of happiness to one. BLES'SING, imp.: N. a wish of happiness to another; gift; benefit or advantage; divine favor. BLESSED or BLEST, pp. *blĕst:* ADJ. made happy; enjoying felicity. BLESSED, a. *blĕs'sĕd,* happy and prosperous; enjoying spiritual happiness. BLES'SEDLY, ad. *-lĭ.* BLES'SEDNESS, n. happiness; the favor of God; felicity. BLES'SER, n. one who. SINGLE BLESSEDNESS, the state of an unmarried person; a felicity enjoyed alone. *Note.*—BLESS and BLISS are not connected etymologically, though made apparently to become so by the modern mixing up of their meanings.—SYN. of 'blessedness'; felicity; joy; happiness; bliss; beautitude; blessing.

BLESS'ED THISTLE: see THISTLE.

BLESS'INGTON, MARGARET, Countess of: 1789, Sep. 1—1849, June 4; b. Knockbritt, near Clonmel, Tipperary county, Ireland, where her father, Edward Power, was settled. At the early age of 15 she was married to Captain Farmer, and, shortly after his death, to Charles John Gardiner, Earl of Blessington. With him she took several extensive journeys on the continent, where, as well as in London, she gathered around her all the most distinguished men of the time. In Genoa, she formed an intellectual friendship with Lord Byron, and afterward resided in Paris, until the death of her husband, 1829. The latter left her a large estate, which enabled her to gratify her literary tastes. Her celebrated soirées were frequented by many of her distinguished contemporaries. Her subsequent connection with Count d'Orsay placed her in an equivocal position as regards society, and consequently, on the accession to power of Louis Napoleon, with whom both were intimate, they left England for France; and at Paris she died. She was the authoress of two works of little importance, *Idler in France,* and *Idler in Italy.* Her only valuable production is her *Conversations with Lord Byron* (1834), which helped to place the poet in a more favorable light before his countrymen.

BLETCH'INGLY: town, chiefly agricultural, in the s.e. of Surrey, 20 m. s. of London. Many Roman coins have been found in the vicinity. Near B., 2,000–3,000 tons of fuller's-earth are raised annually. In cutting the B. railway tunnel, the fossil bones of the iguanodon, an extinct reptile, were found. Pop. abt. 2,000.

BLETHER, n. *blĕth'ĕr* [Scotch]: babbling, foolish talk: V. to talk idly.

BLETS: rotten spots in apples, pears, and other fruits. The rotting of such fruits is often called *bletting.* It takes place chiefly by the decomposition of the proteine (q.v.) compounds which the fruits contain, and the fermentation of the sugar; carbonic acid is formed; and the fibres of a fungus can be discovered by the microscope pervading

the bletted part, to the rapid extension of which they no doubt greatly contribute, although it by no means follows that the presence of the spores or seeds of the fungus should be regarded as the original cause of the decay.

BLETTING, n. *blĕt'tĭng* [F. *blette*, over-ripe: L. *blĭtĕŭs*, tasteless—from L. *blītum;* Ger. *bliton*, a tasteless vegetable, but used as a salad]: the change that occurs in the pulp of a fruit after being kept for some time, and which by a sour, hard fruit becomes soft, edible, and pleasant.

BLEW, v. *blô:* see BLOW.

BLICHER, *blik'ĕr*, STEEN STEENSEN: 1782–1848; b. at a village of Viborg; son of a pastor in Jutland: distinguished modern Danish poet and novelist; took his theological degree at Copenhagen, 1809. He was long known only as the successful translator of Ossian, 2 vols. (1807–09). His *Sneeklokken* (1826), and still more his contributions to the monthly periodical *Nordlyset*, brought him into fuller notice; and in 1829, his *Jydske Romanzer* had great success, and his *National Noveller*, giving a poetical and faithful picture of country life in Jutland, were even better received. As a poet, B. is thoughtful, tender, and eminently national, but lacks objectivity. His novels appeared in 5 vols. (Copen. 1833–36), his poems in 2 vols. (1835–6), and these were followed by *Samlede Noveller og Dichte* (1840), and *Gamle og nye Noveller* (1847–8), etc. Specimens of B. are given in *The Danes sketched by Themselves*, by Mrs. Bushby (1864).

BLIDA, *blē'dâ:* town of Algeria, province of Algiers, abt. 30 m. s.w. of the city of Algiers; beautifully situated on the borders of the fine plain of Metidjah, surrounded by gardens; a prosperous place. It was occupied by the French, 1838. It is a station on the first line of railway in Algeria, and has an active transit trade in the agricultural forest, copper, and lead-mining products of the region. Pop. 13,000.

BLIGH, *blī*, WILLIAM: 1753–1817: English admiral; celebrated in connection with the mutiny of the *Bounty*. Having made a voyage round the world under Captain Cook, he was sent out, 1787, Dec. 23, by the British govt., as commander of the ship *Bounty*, to Tahiti, there to collect bread fruit-tree plants, and thence sail with them to the West India colonies, where it was desired to introduce them. The ship arrived at her destination in Oct. of the following year, and in six months later was ready to sail for Jamaica, with 1,015 plants on board. Partly on account of their demoralization by their long stay on so charming and productive an island and partly owing to the harsh and tyrannical treatment they met with from their commander, a part of the crew mutinied after they had been 24 days out, Apr. 28, and forced the captain and eighteen men into the ship's launch, which they cast adrift, turning their own course back to Tahiti,

and ultimately settling on Pitcairn's Island (q.v.). The captain and his companions, who had very little provision, and no sextant or map, arrived, after almost incredible hardship, at the island of Timor, June 14, 3,600 nautical miles from the point where they were abandoned. To the skill and prudence of B., the fact that not a single life was lost is chiefly attributed. On B.'s arrival in England, a man-of-war, under Captain Edwards, was sent, at his instance, to capture the mutineers. Some of them were seized; the rest had escaped to Pitcairn's Island, with Fletcher Christian, the leader of the mutiny. Their place of refuge, however, was not discovered until 1808, when an American ship accidentally touched at the island. At that time, drunkenness, debauchery, and unbridled passion had left only one of the mutineers, John Adams, remaining. Their fortunes here were made the subject of a poem by Byron, entitled *The Island; or Christian and his Comrades.* B. was again sent out to collect breadfruit-trees, and convey them to the West Indies, in which he was completely successful. In the French revolutionary war, B. commanded a ship of the line, but again exciting the disaffection of his men by his harshness, they mutinied, and ran the ship into a French harbor. In 1806, B. was appointed gov. of New South Wales, but his conduct here was so tyrannical as to cause universal dissatisfaction; and in 1808, the civil and military officers of the colony summarily terminated his government by arresting him.

BLIGH'IA: see AKEE.

BLIGH ISLANDS: that portion of the Fiji archipelago originally discovered by Tasman, 1643, which was seen by Captain Bligh of the *Bounty*, during his wonderful voyage in an open boat; in nearly 180° of long. and 15° 30′—19° 30′ s. lat.

BLIGHT, n. *blīt* [AS. *blæc*, pale; *blican*, to shine: Low Ger. *blekken*, to shine: Icel. *blikja*, to gleam: O. H. G. *blich-fiur*, blight-fire or lightning—from the idea of being blasted with lightning]: a disease common to plants, by which they are withered either wholly or partially, usually caused by minute fungi; anything nipping or blasting: V. to retard growth or prevent fertility; to blast; to frustrate. BLIGHT'ING, imp. BLIGHT'ED, pp.: ADJ. smitten with nipping or blasting; withered in one's hopes. BLIGHT'INGLY, ad. *-lĭ*.

BLIGHT: a diseased state of the cultivated grasses, especially of the cerealia. The term is vaguely and variously used, having been applied to almost every disease of plants caused by the condition of the atmosphere, or of the soil, the attacks of insects, parasitic fungi, etc., but limited in a strict scientific sense to plant diseases caused by bacteria or fungi. It is frequently applied to the disease in wheat and other grains, which is called also SMUT-BALLS, BUNT, PEPPER BRAND, or STINKING RUST, in which, while the grain retains its usual form and

appearance, the interior of it is filled with a powder of a very fetid odor, consisting of balls so minute that it is calculated that four millions of them may exist in a single grain. These are a parasitic fungus, *Uredo caries* (*U. fœtida* of some botanists). See SMUT.

BLIN, *blăng*, FRANÇOIS: 1827–1866; b. Rennes: French landscape painter, who learned of his master, M. Picot, only how to handle the brush, and followed his own inspirations in executing his landscapes, which were generally taken from nature. B. made his début in the Salon of 1852 with a *View of the Shores of Brittany*, and another landscape that was animated by a band of Bohemians. He took part in all the expositions at Paris, 1852–66, except that of 1855. To the Salon of 1859 he sent two paintings—*Morning on the Heath* and *After the Storm*, which were very favorably received, and particularly admired for their penetrating expression of solitude and silence. He had now found the direction best suited to his talents, and continued to represent on canvas the poetry of the most rugged sites, the gloominess of the shores of Brittany, the solemn stillness of the deep woods, the melancholy aspect of the heaths of Sologne. In 1865 he had on exposition a *Summer Evening in Sologne*, the best work he had yet produced, and for which he received a medal.

BLIN, FRANÇOIS PIERRE: 1756–1834; b. Rennes: a French physician.

BLIN, JOSEPH: 1763–1834; b. at Rennes: French statesman; brother of François Pierre B. He enlisted as soldier at the age of 16 years, served in the Antilles, returned to France, 1783, and declared himself emphatically in favor of the revolution when it blazed forth some years afterward. In 1792, he served as volunteer against the Prussians, and obtained the rank of captain. The following year he led a company of national guards against the Vendeans. In 1798, he was elected deputy to the council of five hundred. Under the Consulate and the Empire he kept aloof from politics, and became post-master of Rennes. He was deprived of his place by the Bourbons in 1815, and refused to retake it in 1830.

BLIND, *blĭnt*, KARL: German author and revolutionist: b. Mannheim, 1826, Sep. 4; d. London, Eng., 1907, May 31. For his activity in the revolutionary movement of 1848 he was sentenced to 8 years' imprisonment, but was rescued by the populace. In 1852 he found it necessary to take refuge in London for 15 years, till being pardoned by the govt. of Baden he returned to Germany. He was always an advocate of extreme democratic principles in govt. In literature, his work comprises numerous magazine articles and volumes in various departments of politics, history, mythology, and Scandinavian folklore, with biographies of Ledru-Rollin Deák, and Freiligrath.

BLIND.

BLIND, a. *blīnd* [AS. *blind;* Goth. *blinds;* Ger. *blind;* Icel. *blindr,* blind—connected with *blink*]: deprived of sight; wanting discernment; heedless; inconsiderate; morally depraved: V. to deprive of sight; to darken; to deceive: N. something that darkens or obscures; a cover or screen; a pretense. BLIND'ING, imp. BLIND'ED, pp. BLIND'LY, ad. *-lĭ,* in a manner implying blindness; without examination. BLIND'NESS, n. want of sight; intellectual darkness. BLINDS, n. *blīndz,* in *mil.,* a temporary defense in presence of an enemy, made of branches interwoven. BLINDAGE, n. *blīnd'āj,* in *mil.,* a single or double row of beams leaning against a wall or parapet, and covered with sand-bags, or earth and fascines. BLINDERS, *blīnd'-ėrz,* the same as BLINKERS. BLIND'FOLD, v. [AS. *blind,* blind; *fyllan,* to strike, to fell—*lit.,* to strike blind]: to make blind; to hinder from seeing: ADJ. having the eyes covered; having the mental sight obscured, as 'he walked into the danger blindfold.' BLINDFOLDING, imp. BLIND-FOLD'ED, pp. BLINDMAN, the postoffice employe who deciphers indistinct addresses of letters, etc. BLIND-MAN'S-BUFF [Ger. *blinzel maus*], a play or game, in which one having his eyes covered tries to catch any other of the players. BLINDMAN'S-BALL, a common fungus or puff ball, of the genus *Lycoper'don,* full of dust when ripe. BLIND COAL (see ANTHRACITE), those coals which, deficient in bitumen, burn away without flame. BLIND-FISH, an eyeless fish, *Amblyopsis spelæus,* found in Mammoth Cave in Kentucky. BLIND HOOKEY, a game of chance at cards requiring no skill, but only guessing what card will turn up in cutting the pack—that is, lifting a number of cards at one time from the pack. BLIND SIDE, the side on which danger is least perceived; a familiar term for a weakness or foible. BLIND-WORM, a small reptile covered with scales, and having a forked tongue, but harmless—called also SLOW-WORM. BLIND-NETTLE, or DEAD-NETTLE, a nettle which does not sting—so named as *blind* or wanting in stinging properties: see NETTLE. A MERE BLIND, something done openly as a cover for a secret design. A BLIND ALLEY, an alley or lane with no outlet; a cul-de-sac; called in Scot. 'a close.'

BLIND, THE: those either partially or totally lacking the sense of sight. Comparatively few are born blind, the greater number becoming so by accident. See BLINDNESS.

Those who are born blind have no idea of vision, and are entirely destitute of all the ideas derived from the sense of sight. They cannot, therefore, be sensible of their misfortune in the same degree as those who have lost their sight at a later period. Experience has shown that those who acquire the power of seeing after being born blind, or having lost their sight in their childhood, form very different ideas of visible objects from other persons. The other senses of persons, who have been blind for a long time, become more exquisite, perhaps, because they are not subject to the distraction produced by the sight of

so many objects. The blind, therefore, are often distinguished for a remarkable mental activity, and a wonderful development of the intellectual powers. Their touch and hearing, particularly, become very acute.

Education of the Blind.—The first permanent educational institution for the blind was founded in Paris in 1784 by Valentin Haüy; this is the National Institution for the Blind, where both sexes are given careful training fitting them for self support. Those taking the technical course are expected to remain five years, and music pupils eight years. Manual training for all pupils and household arts for the girls are considered of the greatest importance. This institution is practically the model for other French schools for the blind, and supplies teachers to many of them. The Société Valentin Haüy maintains workshops for the blind in which they instruct men who have lost their sight after school age, in brush making and other trades; the blind women receive instruction in house industries, needle work, etc., either at the institution of the Blind Sisters of St. Paul, or in their homes under the care of the Sisters. The Valentin Haüy Association also sells the work of blind men and women at its central office, giving them a percentage of the receipts.

In Germany there are many educational institutions for the blind, and even the smaller towns have workshops where blind men and women carry on various trades, such as caning, brush-making, and willow-weaving. One of the most interesting German educational methods for the blind is what is known as the Saxon system, originating at the Dresden Institution. By this system, the pupils when they are sufficiently proficient in the trades to be self-supporting are given an outfit of tools and materials, and established in a suitable locality,—preferably their own homes. They are kept in touch with the institution by correspondence and by the appointment of a guardian, —usually some person of influence, who advises and aids them, and keeps the school informed of their progress.

In England there are many agencies for assisting the blind. London alone has 7 workshops, 2 societies for visiting the blind, 2 homes for the blind, and many schools, including several day schools. Of the schools one of the most noted is the Royal Normal College for the Blind; this is intended especially for the education of the intelligent blind, and does not admit those who are backward. Physical training and athletics are given an important part in the work of this school, and the athletes have competed successfully with seeing athletes. Outside of London the leading institutions are the Birmingham Institute, which has an excellent kindergarten, the Edinborough Institute, and the Glasgow Shop and Institute, which cares for the blind from childhood to old age and conducts several successful industrial enterprises. The British and Foreign Blind Association was founded in 1868. Its chief objects are to discover the best methods of educating and employing the blind, and to persuade people

to adopt these methods; to produce writing frames, books, and other educational apparatus for sale at the lowest possible price; to collect and diffuse information; and to advise on all subjects relating to the blind.

In the U. S., the work of systematically educating the blind began in the early part of the 19th century. In 1829 certain gentlemen in Boston obtained the incorporation of the "New England Asylum for the Blind." The services were obtained of a graduate of Brown University, Dr. Samuel G. Howe, who went at once to Europe to study methods of instruction. Upon his return, in 1832, the school was opened with 6 pupils. In New York the act of incorporation of the New York Institution for the Blind was passed in 1831; but funds were needed and no one went abroad to study methods. This school opened in March, 1832, antedating by a few months the school at Boston. In the very same year a German teacher of the blind, a Mr. Friedlander, came to Philadelphia, in the hope of starting a school for the blind there. Having trained certain blind children he exhibited their accomplishments, *first*, to a few influential people, *secondly*, before a large audience among whom he distributed a leaflet, "Observations on the instruction of blind persons." A meeting of public-spirited citizens followed, funds were liberally contributed, fairs held, and the success of the cause was assured. The Pennsylvania institution for the instruction of the blind was opened in 1833, fully 10 months before an act of incorporation was obtained. The three schools at Boston, New York, and Philadelphia are called the pioneer schools. All sprang from private effort and private funds. All were incorporated as private institutions, and remain so to this day. Two similar institutions for the blind have arisen in this country, that at Baltimore and that at Pittsburg.

The origin of the state schools differs from that of the type above given only in that classes of trained pupils from the earlier schools were exhibited before the state legislatures, as well as before the people. State appropriations followed and the institutions were inaugurated as state institutions. The new schools sprang into being with astonishing rapidity, and every state in the union now makes provision for its blind of school age either in its own school or in that of a neighboring state. In our sparsely-settled country, especially west of the Alleghenies and south of Maryland, great efforts had to be made to find the children and still greater efforts to persuade the parents to send them to school. In certain states where the amount of the public fund seemed to preclude a special grant for the blind, pupils of this class were brought together in connection with a school for the deaf and dumb, forming "dual schools," as they are called. But these schools were not successful, and they have been very generally separated into two distinct institutions.

In northern schools the colored blind are educated with the white, in southern states the colored have schools

of their own, both races preferring this arrangement. The first school for the colored blind was opened in North Carolina in 1869.

All the institutions for the blind were schools from their very inception. Literary teachers for the pioneer schools were brought over from Paris, and handicraft teachers from Edinborough. At first only the brighter class of pupils came under instruction; soon, however, less bright pupils were admitted, and the curriculum of studies began to sober down to the practical and comprehensive one prevailing to-day. When, as was formerly the case, the period or term of schooling allowed pupils was shorter than it is now, they were not admitted before the age of 8 or 9. Now that kindergarten departments have been universally added to the schools, the pupils are urged to enter at an early age; because experience has shown that at home these little blind folks are coddled rather than trained, and that of all the useful means of reaching and developing the average blind child none is so effective as the properly-conducted kindergarten. The practical knowledge of things comes to the blind through the hand, their fingers being veritable projections of their brains. Thus must their hands not only be trained to sensitiveness to touch but to be strong and supple, so that they may, indeed, be dexterous; for as their hands are so are their brains. The kindergarten cultivates ear and heart and hand and brain as nothing else does. Even color is not wholly omitted in kindergartens for the blind. Many see colors, and those who do not love to talk about them and certainly derive some indirect value for considering them. Blind children with kindergarten training are more susceptible to instruction than those without it. Above this department the course of studies in American schools requires from seven to eight years, which means a primary, a grammar and a high school education, or instruction in object lessons, reading, writing, spelling, grammar, composition, arithmetic, history, physiology, botany, zoölogy, geology, physics, algebra, geometry, civics, English literature, typewriting and sometimes Latin and modern languages. Not a few pupils have fitted for college where they took the regular course with the seeing students, and from which they were graduated usually with distinction. Formerly much of the teaching was oral, which, in many cases, was apt to be more pleasant than profitable to the pupil. Since the general introduction of the embossed text book and tangible writing, the pupil has been forced to depend more and more upon himself, obviously with better results. In fact, the work has been growing more and more practical. The methods of teaching the blind correspond in general to those of teaching other hearing children. The common appliances have but to be raised and enlarged as in maps and diagrams, or simply made tangible, which may be done, for example, by notching an ordinary ruler so that the graduations can be felt.

Industrial training has been an integral part of the

school course from the beginning. Recently educational manual training has been generally introduced as preliminary to the trades. Sloyd has been found especially adapted to the blind. The handicrafts—chair-caning, hammock-making, broom-making, carpet-weaving, and a few others, alone remain of all the many trades taught at one time or another in our schools. Manual occupations of some kind will always be taught, even were it evident that none of them would be followed by the blind as trades; for it is by doing and making that the blind especially learn best. Then, it is essential that they be kept occupied. The mind itself of the blind is least trammeled by the lack of sight; hence some pursuit where intelligence is the chief factor would seem to be best adapted to his condition. Music, of course, opens up his most delightful field. In the schools to-day only those pupils pursue music in regular course who have talent for it; but even those are not allowed to neglect other studies for it. It is the experience of the American schools, as of the European, that the profession of music offers to the educated and trained musician who is blind, a field in which he can work his way with least hindrance from his lack of sight, and many are they who have found in it a means of livelihood for themselves and their families. The blind are also very successful as piano tuners. Recently a few have taken up stenography and telegraphy, in which they have also been successful in several notable instances. Athletics have been given an important place in many institutions; most of them have had gymnasiums and outdoor play grounds, but the Kentucky Institution for the Blind was the first to organize a football team in 1904, which after a season's training was able to play against teams from ordinary schools. Since that time the institutions at Overbrook, Pa., and Columbus, Ohio, have also organized football teams. The Kentucky institution also has a track team. This encouragement of sport among the blind has proved of great advantage, not only in improving their physical condition, but also in teaching love of fair play and self reliance. The Association of American instructors was formed in 1871, has met biennially ever since, usually as the guest of one or another of the institutions. The proceedings of each convention have been published. The principles underlying the scheme for educating the blind being to make them as little as possible a class apart from the rest of the community, it has not been deemed wise to attempt to establish a national college for the higher education of those capable of taking it, but efforts are making towards enabling the brighter and worthier pupils to attend one of the colleges for the seeing, at the expense of the states or the schools from which they come.

The home teaching societies in the U. S. have not been developed to such an extent as in France and England; there is, however, a rapidly growing movement for better societies of this nature. For several years the legislature

of Mass. has made an appropriation for home teaching and has employed teachers to visit the adult blind of the state in their homes, instructing them in reading, writing, and to some extent in the manual arts. R. I. has two blind teachers, Del. one, and the Pennsylvania Home Teaching Society three. In New York, the state has made no appropriation for home teaching, but the New York City Public Library has one teacher giving instruction to the blind in reading and writing. The New York Association for the Blind was organized in 1905, Nov.; its advisory board includes several prominent men and women outside the state, and the value of its work reaches beyond state limits. In addition to its efforts to awaken interest and improve methods in the education and care of the blind, and especially of the adult blind, its activities in New York City include home teaching in reading, writing, and many of the trades; a workshop for blind men; work given to blind women in their homes with the intention of establishing a shop for women as soon as possible; the blind men's self improvement club; the prevention of blindness by proper medical instruction; and general "social service" for the blind, caring for the infirm, giving of necessary relief, obtaining employment, etc.

Books and Libraries for the Blind.—The first embossed book for the use of the blind was printed in Paris, 1784, by Valentin Hoüy, from flat movable letters, which his pupils had been previously taught to put together and read. Printing for the blind was introduced into Britain by James Gall of Edinburgh in 1827; the alphabet he used was a triangular modification of the common alphabet. In the U. S. the printing of embossed books was begun by Dr. Howe in Boston; he adopted an angular modification of the common alphabet, similar to, but smaller than Gall's. This is often known as the Boston line print. It was at first the theory that books for the blind should be printed in a type legible by the seeing; but it was found that many of the blind could not read a line-letter system, and that characters composed of points were best adapted, to touch reading. The first point system was devised by Louis Braille of Paris in 1829. It consists of the 62 varieties of form which six dots, ⁝⁝, can be made to assume by the omission of one or more of them. This supplies not only the letters of the alphabet, but numerous other signs. Though much used by individuals it was not officially adopted in the Paris school until 1854. It is now much used in France and Great Britain. The French magazine the *Louis Braille Review* and fourteen magazines in England are printed in this type. The books printed under the auspices of the British Blind Association are also in Braille, there being about 3,000 of them. In the U. S. the first point system is known as New York point; it was invented by Mr. Wait of the N. Y. Institution for the Blind in 1868, was immediately adopted by a convention of American instructors, and is still widely used in America. The signs, as in the braille system are produced by six dots,

but they are placed horizontally :::. All books printed by the Maryland School for the Blind, by the American Printing House for the Blind at Louisville, by the State of New York, and by the Society of St. Francis Xavier, are in New York point; the Maryland School in 1903 published the first general dictionary for the blind, containing 40,000 words. There is also an excellent musical library and a dictionary of musical terms in this type. A typewriter, and a machine for embossing brass plates from which any number of duplicates can be printed have been invented for New York point. Every tangible system has its defects. French "braille" as adopted into England has antiquated abbreviations and contractions for the use of adults; and is involved with rules allowing much bad use, like the omission of all capitals. The New York point as printed also laid itself open to much criticism as to "good use." The American braille, the latest system, combining the best features of French braille and of New York point, was devised by a blind teacher of the Perkins institution. It takes full account of "good use," and those who use the system deem it very satisfactory. In 1892, when the American braille system was adopted into several schools, a typewriter and a machine for embossing brass plates were invented, preceding the similar inventions for New York point. The chief value of the latter lay in the fact that as the machine was simple and inexpensive and could be operated if necessary by a blind man, any institution could have a printing office of its own. And several schools immediately established such offices, from which they issued at once whatever their school classes demanded. By co-operating in the selection of the books to be embossed these schools have created a library of books in American braille than which there is no superior in any system in any country, and they have added an immense amount of music in the braille music notation, which is the same all over the world. A magazine was established in 1906 by a gift from Mrs. Ziegler which is printed in both New York point and the American braille.

One of the older English types for the blind still persists; this is the Moon type invented by Dr. Moon of Brighton. He uses an arbitrary alphabet some of the characters resembling or suggesting the letters which they represent. Dr. Moon's printing is larger than any other, and therefore more easily felt. This is a great advantage to beginners and to those whose touch is dulled, and it is practically the only type which some can read. The demand for Moon books still increases in both England and the U. S. The greater part of the books in this type are printed by the Moon Society at Brighton, England, and a monthly magazine is also printed.

The libraries for the blind are often connected with the various institutions, or with public libraries; and are also maintained separately by private societies. The Société Valentin Haüy maintains several libraries in Paris, all in charge of blind librarians, from which books are sent to

blind readers throughout France, and even to other countries. In London there are six regular loan libraries for the blind besides others connected with public libraries. In the U. S. Congress in 1879 appropriated $250,000 to be permanently invested in U. S. securities, the proceeds to be applied to the making of books and apparatus used in the education of the blind to be annually distributed to the schools for the blind in the separate states in proportion to attendance. An excellent library for the blind has been built up in connection with the Library of Congress, which occupies a specially well-equipped reading room in the new building. Some public libraries in the large cities have books for the blind, and the New York State Library has an excellent system of traveling libraries for the blind, the books being sent all over the state.

BLINDE, Mathilde, German-English poet: b. Mannheim, 1847, March 21; d. London, 1896, Nov. 26. She went to England in 1849, and won fame by her writings: *The Prophecy of St. Oran, and Other Poems* (Lond. 1881); *Life of George Eliot* (1883); *Madame Roland* (1886); *The Heather on Fire, a tale* (1886); *Ascent of Man* (1889); *Dramas in Miniature* (1892); *Songs and Sonnets* (1893); and *Birds of Passage* (1895).

BLINDNESS: lack of sight, due to obstruction in some part of the eye to the rays of light passing to the optic nerve, or to disease of that nerve, or of that part of the brain connected with it. See Amaurosis; Eye; Vision. Much interest is manifested in the effect of the loss of the visual sense upon character and mental development. Within recent years important contributions to the psychology of the blind have been made and have led to more precise notions as to the manner of improvement of the tactile and other senses found among the blind. (see Blind, The), the peculiarities of their imaginative and associative processes, the nature of their emotional temperament. It has been indicated that their refinement of perception, while in part an actual increase of sensibility of impressions likely to escape the seeing, is for the most part but a clever interpretation of impressions which all possess. Inasmuch as for the seeing, the same type of information and distinction is rendered available through sight, the seeing neglect these accessory indications so valuable to the blind. Sensibilities displayed by the blind thus acquire a rational interpretation. The fact that the blind use the same language as the seeing, learn by inference the kind of information which the seeing actually enjoy under common situations, makes it difficult to detect the mental defects. The study of their dream life, which is spontaneous and unaffected by these complications, has revealed the complete dependence (in the congenitally blind) upon auditory and tactual imagery. The fading away as well as the retention of visual thought terms in those becoming blind is also thus revealed. Generalizations in regard to emotional temperament cannot

be summarized. One may venture the suggestion that the possession of a ready human intercourse (from which the deaf are cut off) and the participation in the world of music tend toward a cheerfulness, while the susceptibility to mishap engenders a timidity and dependence. Exceptions to all such statements are abundant.

Mental B. is the inability to recognize objects, though the objects themselves are seen. It is the result of injury to the highest brain centres for vision. In dogs and monkeys the injury to this visual area still leaves the injured animals able to guide their steps and avoid obstacles, but they respond no differently to one object than to another except as such recognition involves other senses. In the far more complexly organized brain of man, mental blindness stands for the falling away of the cluster of associations of a visual type that makes possible the easy recognition of objects under normal conditions. It goes beyond mere weakness of visual imagery, and may extend so far as failure to recognize such common implements as a knife and fork, the articles of dress, or again the faces of relatives and friends. The fact that such impairment is at times functional and is recovered from makes possible a description, by the patient upon recovery, of the peculiar nature of the mental gap. When mental blindness is still more highly specialized and is confined or nearly so to the loss of interpretation of written or printed symbols, the condition is termed word-blindness. The tendency of such defects to be associated with an actual blindness in half of each retina (Hemianopsia, q.v.) indicates its connection with disturbance of the optical centres (in the occipital lobe).

Congenital B. is generally from some deficient development of the nervous apparatus, and is detected by the child being indifferent to light, and throwing its head from side to side. Occasionally, but very rarely, the power of vision is afterward developed.

Opacity of the vitreous humor, or of the crystalline lens—the latter is generally known as cataract—causes B., which comes on gradually. The patient with cataract can see best in the evening, or when the pupil is dilated, as then some rays of light are able to enter by the side of the opacity. The B. from cataract is seldom so complete as to prevent the person from distinguishing day from night, or from being aware of opaque bodies passing between him and the light (see CATARACT). Opacities of the cornea, if extensive, or in the axis of vision, produce some degree of B., whether they are on or in its substance. In general, these are irremediable; but in rare instances the opacity has been removed by operation and more or less perfect vision obtained. In other cases a fair degree of sight may be restored by cutting out a bit of the iris so as to enlarge the pupillary opening and enable the rays to enter at the side of the opacity.

Night B. is a rare condition, in which a person finds, toward evening, that objects are becoming less and less

distinct, and at last that he is totally blind. This may occur without previous warning, and cause great alarm, but next morning he finds that his sight is restored. This is repeated every night, but at last the eyes become weak during the day also, and may finally become amaurotic. This strange affection may be epidemic; it has attacked bodies of troops exposed to great fatigues and the glare of the sun's rays. If there are no symptoms of disease within the brain, recovery generally results from protecting the eyes from the light, entire repose, and such remedies as correct any constitutional defect in the individual attacked.

Day B., a symptom connected with disorder of the visual apparatus that makes vision in bright light difficult. The condition (though it may be differently induced in some cases) is similar to the transitory difficulty experienced when emerging from a half-dark space into a lighted one. The opposite condition is night-blindness.

Recent advances in knowledge of the anatomy of the eye (see EYE), with the discovery of the ophthalmoscope, and improved methods of examining the eye for errors of refraction, enable surgeons to improve vision in cases which 30 years ago would have been hopeless; but it should be remembered that overwork wears out the eyes; and it should be strongly impressed, especially on the young, that if vision fails when the eyes are used continuously on fine work, such as reading or sewing, it is best to consult an oculist—not an optician—and to submit the eyes to a thorough examination. Probably such an examination will show some error of refraction which when properly corrected by suitable glasses will enable the patient to use the eyes with comfort. See REFRACTION, ERRORS OF.

BLIND'NESS, COLOR: see COLOR BLINDNESS.

BLIND'STORY: name for the *triforium* (q.v.), the second or middle arcade in the wall which separates the body from the aisles of a church. It is so called obviously as opposed to the *clearstory* or *clerestory* (q.v.), the third and uppermost arcade, the apertures of which admitted light into the church, while the apertures of the triforium were dark—*obscuræ fenestræ*, as they are termed by Gervase of Canterbury. The B., which is most usual in cathedral, conventual, and collegiate churches, served to give access to the various parts of the building, and to suspend tapestry and banners on high holidays. Viewed æsthetically, the gloom of the B. contrasts well with the lustre of the clerestory.

BLIND'WORM (*Anguis fragilis*): small reptile, commonly ranked among serpents by naturalists, in consequence of agreement in general form, but showing remarkable points of difference from the true serpents, and forming one of an interesting series of links by which they are connected with lizards. In the genus *Anguis* there is no trace of limbs externally, but the bones of the shoulder,

the sternum or breast-bone, and the pelvis still exist in a rudimentary condition: the bones of the head, also, connect it with lizards, and do not admit of that dilatation of the gape which characterizes true serpents. The common B. is found in almost all parts of Europe. It is entirely inoffensive, although generally persecuted by the ignorant as extremely venomous. Its teeth are so small that even when it attempts to bite, which it only does upon much irritation, it cannot pierce the skin. No species of the group to which it belongs has poison-fangs. It is very timid, and when alarmed contracts itself forcibly, and then becomes remarkably brittle, so as to be easily broken in two by a blow or by an attempt to bend it. This character of fragility is found also in other animals of this group. The name B. has apparently originated in a mistake caused by the smallness of the eyes, which, however, are very quick and brilliant. Another common name, *Slow-worm*, is more accurately characteristic. The length varies from 11 to 15 inches, and sometimes even exceeds this; the thickness is almost equal throughout, the tail is blunt at the end; the scales are small, and nearly equal; the tongue is notched at the extremity, but not bifid as in snakes; the color is generally silvery gray, a dark line runs along the back, and frequently there are rows of dark spots along the sides. The food of the B. consists of slugs and insects. It retires in autumn under masses of decayed wood and leaves, or into soft dry soil. It changes its skin. It is viviparous (ovoviviparous), the number of young varying from 7 to 12 or 13 at a birth. The name B. is sometimes given to *Cœcilia* (q.v.).

BLINK, n. *blĭngk* [AS. *blican*, to dazzle: Ger. *blicken*, to shine, or *blinken*, to twinkle]: a twinkle or glimpse of light; a wink; a glance; a look; a moment; a very brief time: V. to wink; to twinkle with the eye; to see dimly or obscurely; to evade. BLINK'ING, imp.: ADJ. having obscure vision; dim-sighted. BLINKED, pp. *blingkt*. BLINKARD, BLINKER, n. *blĭngk'ėr*, one who or that which. BLINK'ERS, n. plu. *-ėrz*, coverings for the eyes of a horse to keep it from seeing on either side. BLINKY, a. *blĭnk'ĭ*, liable to wink by overstraining the eyes. TO BLINK THE QUESTION, to shut one's eyes to it; to make one's self wilfully blind to it. SNOW or ICE BLINK, the peculiar reflection from snow or ice in arctic regions.

BLISS, n. *blĭs* [AS. *blis*, joy; *blithe*, merry, joyful: Bohem. *blaze*, happily (see BLESS)]: happiness in a very high degree; felicity; joys of heaven. BLISS'FUL, a. *-ful*, full of bliss. BLISS'FULLY, ad. *-lĭ*. BLISS'FULNESS, n. the state of exalted happiness; felicity. BLISS'LESS, a. without bliss.—SYN of 'bliss': happiness; felicity; blessedness; blessing; beatitude; joy; enjoyment.

BLISS, AARON THOMAS, American politician: b. Smithfield, N. Y., 1837, May 22; d. 1906, Sept. 16. He served in the Federal army during the Civil War, and was for six months a prisoner in Andersonville, Columbia, and

other Southern prisons. In 1865 he settled in Saginaw, Mich., where he was engaged in lumbering, banking, and other business enterprises. He was a member of Congress, 1889–91, was elected governor of Michigan in 1900, and re-elected 1902, Nov. 4.

BLISS, Cornelius Newton, American merchant and statesman: b. Fall River, Mass., 1833, Jan. 26. He was educated in New Orleans; entered his stepfather's counting room there; engaged in the commission business in Boston, and became head of the dry goods commission house of Bliss, Fabyan & Company, New York, in 1881. He was a member of the Pan-American Conference; chairman of the New York Republican State Committee 1877–8; and treasurer of the National Republican Committee in 1892, 1896, and 1900, 1904; declined to be a candidate for governor of New York in 1885 and 1891: and was secretary of the Interior Department in President McKinley's Cabinet in 1897–8.

BLISS, Daniel, d.d.: American missionary: b. Georgia, Vt., 1823, Aug. 17. After preparing at Kingsville, O., Acad., he entered Amherst, where he graduated 1852. He studied at Andover Theol. Sem. 1852–55, and was ordained to the Congl. ministry. During the next 6 years he was a missionary of the Amer. Board at Mt. Lebanon, Syria; then for two years sec. to the Amer. Board in New York; afterward for two years working in England for the Protestant Coll. at Beyrout, Syria, of which he became pres. 1864. He is author of several philosophical works in Arabic, including *Mental Philosophy* and *National Philosophy*.

BLISS, Edwin Elisha, d.d.: missionary: 1817, Apr. 12—1892, Dec. 29; b. Putney, Vt. He graduated from Amherst Coll. 1837, was a teacher in Amherst Acad.; then took a full course at Andover Theol. Seminary, graduating 1842, and being ordained to the Congl. ministry 1843. He served as missionary 1843–52 at Trebizond, and 1852–56 at Marsovan in Armenia. In 1856 he went to Constantinople, where he remained until his death. He received his degree of d.d. from Amherst 1869. After 1865 he edited *The Messenger* at Constantinople in the Armenian and Turkish languages. He was skilled in eastern languages and also compiled books useful in missionary work, such as the *Bible Handbook* in Armenian.

BLISS, Edwin Munsell, American missionary: b. Erzerum, Turkey, 1848, Sept. 12. He was educated at Robert College, Constantinople; at the high school, Springfield, Mass., and at Amherst College, where he graduated in 1871, later taking a course at Yale Divinity School. In 1872 he was sent to Constantinople as agent for the American Bible Society, and traveled in Turkey and Persia. On his return to the United States in 1888 he edited the *Encyclopædia of Missions*. He has also written *The Turk in Armenia, Crete, and Greece*, and *A Concise History of Missions*. From 1896 to 1901 he was associate editor of the New York *Independent*.

BLISS, Frederick Jones, American explorer (son of Daniel Bliss, q.v.): b. Mount Lebanon, Syria, 1859, Jan. 23. He graduated at Amherst College in 1880, and at the Union Theological Seminary in New York in 1887; was principal of the preparatory department of the Syrian Protestant College of Beyrout for three years; was appointed explorer to the Palestine Exploration Fund in 1890, and is best known for his excavations and finds in Jerusalem in 1894–7. Here he unearthed an ancient city wall with towers, besides streets, drains, stairways, churches, and other structures. He has published *Mounds of Many Cities; Excavations at Jerusalem*, etc.

BLISS, George, American lawyer; b. Springfield, Mass., 1830, May 3; d. near Wakefield, R. I., 1897, Sept. 2. He graduated at Harvard College in 1851; studied for two years in Berlin and Paris, and after his return read law principally at the Harvard Law School. He established himself in practice in New York. In 1859–60 he was private secretary to Gov. Morgan; in 1861 was appointed to his staff; in 1862 became paymaster-general of New York; and in that and the following year organized three regiments of United States colored infantry under instructions from the secretary of war. In 1866 he was appointed attorney for the Metropolitan boards of excise and health; in 1872, United States attorney for the Southern District of New York, and in 1881 a special assistant to the United States attorney-general for the prosecution of the 'Star Route' postal cases. He drafted the New York charter of 1873; drew up the New York Consolidation Act, and was author of the first tenement-house act for the city. He published three editions of the *Law of Life Insurance* and four editions of the *Annotated Code of Civil Procedure*.

BLISS, Philip Paul: evangelist and singer: 1838, July 9—1876, Dec. 29. He passed his early life in the Penn. and Ohio wilderness, becoming, even in early boyhood, a singer of remarkable power and sweetness. He taught school in Hartsville, N. Y., 1856, and soon afterward began to teach music and compose songs and hymns, which he sang in public with great effect. He had joined a Bapt. church; and having come under the influence of Mr. Moody, he gave himself to fervent and fruitful unsectarian evangelistic work from 1874, and his name became widely known. One of his most popular songs is *Hold the Fort*, founded on an incident of the war; others were *Down Life's Dark Vale We Wander; Jesus Loves Me; Hallelujah! 'Tis Done;* and *Pull for the Shore, Sailor.* His services as a revivalist were in demand throughout the United States and Canada. His songs appeared in the following named collections: *The Charm* (1871); *The Song Tree* (1872); *The Joy* (1873); *Gospel Songs* (1874). He lost his life in the Ashtabula (O.) railroad disaster.

BLISS, Porter Cornelius: journalist: 1838, Dec. 28—1885, Feb. 1; b. Erie co., N. Y.; son of a missionary to the

Indians in w. N. Y. He obtained his education at Hamilton Coll. and at Yale, and made a special study, 1860, of the condition of the Indians of Maine and the seaboard provinces. He went to Brazil in 1861 as private sec. to the U. S. minister, and studied the Argentine Indian antiquities and dialects, 1862, under a special commission. B. was private sec. of the U. S. minister to Paraguay 1866, and there fell into trouble with the govt., being saved from death only by the determined action of the American govt., backed by a naval squadron. In 1869–70 he edited the Washington *Chronicle;* in 1870–4 he was secretary of the United States legation in Mexico, and during that time made several archæological explorations and wrote on the opportunities of American enterprise in that country. In 1874–8 he was an associate editor of *Johnson's Universal Cyclopædia* and in 1879 went to South America as correspondent for the New York *Herald.*

BLISS, William Dwight Porter, American clergyman: b. Constantinople, 1856. He graduated at Amherst College in 1878, and at Hartford Theological College in 1882; was ordained a Congregational clergyman; became an Episcopal priest in 1887; organized the first Christian Socialist Society in the United States in 1889, and was president of the National Reform League. He edited *The Dawn* (1889–96); *The American Fabian* (1895–6); and the *Encyclopædia of Social Reform,* and published a *Handbook of Socialism.*

BLISS, William Julian Albert, American physicist: b. Washington, D. C., 1867. He graduated at Harvard University in 1888 and pursued a course of studies in electrical engineering at Johns Hopkins, Baltimore, at which university he became successively assistant in physics (1895–8), associate (1898–1901), and professor in the latter year. He is the author of several works bearing on his profession.

BLISTER, n. *blĭs'tėr* [AS. *blæsan,* to blow: Icel. *blastr,* the blowing of a bellows; *blasa,* to blow: Dut. *bluyster,* a blister]: a thin white swelling of the skin, generally filled with watery fluid; in *med.,* a plaster composed of such a substance as when applied to the skin raises vesicles filled with serous fluid; the scales on iron or steel: V. to raise blisters; to rise in blisters. Blis'tering, imp. Blis'tered, pp. *-tėrd.* Blis'tery, a. *-tėr-ĭ,* full of blisters.

BLIS'TERED, or Blister, STEEL: the kind of steel from which, by hammering, rolling, etc., certain qualities of tools and files are fashioned. When broken up, piled and welded under the hammer, it forms *shear steel* (see Iron), from which a finer class of tools is made, and when melted in crucibles it forms the finest kind of *cast steel* (q.v.) for cutlery. Blister steel is made from bar iron of superior quality by a process of *cementation;* and the furnace employed for the purpose is termed a converting furnace. It consists of two fire-brick rectangular chests or troughs, each 16 ft. long and 3 ft. deep by 3 ft. wide, as

a maximum size, placed alongside each other in an arched chamber, and surmounted by a wide conical chimney. One long fire-place, with a suitable arrangements of flues, heats both chests. Into each chest the iron bars are laid embedded in charcoal, about half an inch of which intervenes between each layer of iron bars. The whole is then plastered over with clay or grindstone-dust, and kept at a glowing red heat from seven to ten days, according to the purpose for which the blister steel is intended. When the bars are removed after cooling, they are found to have undergone a remarkable change. They are no longer tough, but quite brittle and fusible, and covered over with blisters. During the process, the iron absorbs and combines with from a half to one and a half per cent. of carbon. The blisters are supposed to be due to the evolution of carbonic oxide arising from the combination of carbon with a trace of oxygen existing in the iron.

BLIS'TERING FLIES: see CANTHARIDES.

BLIS'TERS: medicinal agents which, when applied to the skin, raise the cuticle into small vesicles filled with serous fluid. They are applied either in the form of plasters or in a fluid state, as suits the convenience of the person or part, and have for their object the establishing of a counter-irritation or diversion of inflammatory action from a part in which it cannot be reached by remedies, or from some organ where it may do permanent mischief, to some part of the body nearer the surface.

The most common blister in use is made of cantharides (q.v.) or Spanish fly (*Cantharis vesicatoria*). Cantharides, mixed with a convenient proportion of lard and wax, form the blistering ointment of ordinary use; the only objection to this preparation being, that if applied too long it produces distressing affections of the urinary bladder. In young children and very thin-skinned persons, a layer of silver paper, or thin gauze wet with vinegar, may be laid between the blister and the skin. But under no circumstances should a blister be left long upon children, as it may produce sores which are apt to take on an unhealthy action, and are difficult to heal.

Mustard (*Sinapis nigra*) is frequently used, but seldom left on sufficiently long to produce blistering. Tincture of cantharides, croton oil, and strong liquor ammoniæ, tartar emetic ointment, and many others are used in practice.

If the occasion for the blister passes off, the vesicles should be pricked, and their fluid contents allowed to trickle away, the vesicated surface being then dressed with some cold cream or lard. But if it should appear desirable to promote a discharge from the skin, the raised cuticles may be snipped off, and the blister either applied again at intervals, or some stimulating ointment as the savine (*Juniperus sabina*) made use of. Great cleanliness should be observed in dressing the part.

Of late years, B. have been much used for the disper-

sion of glandular tumors and are also applied over the surfaces of indolent ulcers, with the view of increasing the vascularity of the part. For old diseases of joints, B. ought to be placed at a little distance from the affected joint.

BLITE, n. *blīt* [Gr. *bliton;* L. *blītum*, an insipid kitchen vegetable]: a kind of amaranth; a genus of plants called strawberry blite, from the fruit which succeeds the flower resembling small strawberries, ord. *Chen'ŏpodĭācĕæ. Blītum căpĭtātŭm* is the strawberry spinach.

BLITHE, a. *blīth* [AS. *blithe*, merry, joyful: Goth. *bleiths*, mild: Icel. *blithr*, bright, happy: Dut. *blijde*, cheerful]: gay; merry; joyous; sprightly; also in same sense BLITHE'FUL, a. *-fûl*, and BLITHE'SOME, a. *-sŭm*, mirthful. BLITHE'LY, ad. *-lĭ*, in a cheerful, joyous manner. BLITHE'NESS, n. or BLITHE'SOMENESS, n. the quality of being cheerful and joyous; joyful mirthfulness. BLIGHT'SOMELY, ad. *-sŭm-lĭ*.

BLITZ, ANTONIO, SIGNOR: magician: 1810, June 21—1877, Jan. 28; b. Deal, Kent, Eng.; d. Philadelphia. When 13 years old, he performed in Hamburg, Germ.; after travelling two years in n. Europe, returning to England he exhibited, 1825, Dec., in Dover, and also visited Ireland and Scotland. Coming to the United States, 1834, he performed in New York, then throughout the country, afterward in Canada and the West Indies, finally settling in Philadelphia. He recounted his experiences in *Fifty Years in the Magic Circle*, pub. Hartford, 1871.

BLIZZARD, n. *bliz'ĕrd* [seemingly a popular variation from same root as *blow*, *blast*, *blaze*, combining the ideas of great force and extreme speed: compare also Ger. *blitz artig*, lightning-like, which R. H. Chittenden suggests as the origin of the word—quoting *Faust*, Part 2, Walpurgis Night, p. 303, Cotta's ed. 1859]: volley of fire-arms: thence, sudden overpowering attack with words: applied most frequently to a furious gale or storm of wind and drifting snow with severe cold—well-known on the great plains of the n.w. states and territories, particularly the Dakotas, as rushing with a fury not to be faced by man or beast.

A storm unprecedented for the region and called a B., raged over N. Y., N. J., Penn., and the New England states 1888, Mar. 11, 12, 13, and caused a loss of many lives, destruction of a great amount of property, and extraordinary delays in railroad and other means of transportation. In New York and vicinity rain began falling lightly Mar. 11, Sunday, about 3 P.M. About 7 P.M. it became heavier; at 10 it was pouring; and at 11 the rain changed to snow, and the wind, steadily increasing in violence, soon blew a full gale. By daybreak Monday there had been a heavier fall of snow than for several years, and the high winds had piled it in drifts in every direction. Through the day the wind averaged a velocity of 46 m. per hour, but there were frequent and brief squalls in which the velocity was much greater; direction of

the wind due n.; temperature 15°. Before noon horse-car service in the cities within range of the storm was wholly suspended, and as the day wore on streets and roads became impassable, all railroad trains were blocked, telegraphic communication ceased, and telegraph, telephone, and electric-lighting poles, trees, chimneys, roofs, and other portions of building were blown down or far away. Snow ceased falling early in the afternoon, but the violence of the wind did not abate, and as the snow was very light the wind kept on piling it up in huge drifts and embankments. On Tuesday the wind continued at a velocity of 47–60 m. per hour, and the temperature ranged 8° to 15°. Toward night the wind began to subside, and on Wednesday the snow began to melt. Many railroad trains were helplessly snowed in, the region between New York and Pittsburgh *via* Philadelphia, between New York and Albany, and between New York and the cities on the Delaware, Lackawanna and Western railroad appearing to have the worst drifts. The Pennsylvania railroad had more than 12,000 men at work nearly two days, clearing the track and extricating the storm-bound trains between Elizabeth and Jersey City alone. In New York the melting of the snow was expedited by fires of wood and oil kindled in the streets, and business was wholly suspended. The first train through from New York to Philadelphia left Jersey City at 6 A.M. on Monday, and reached Philadelphia at 5 P.M. on Thursday. On the Delaware river and the N. J. coast the injury to shipping was very great, over 30 vessels being sunk or stranded, and several seamen drowned. Short-distance travel by rail was partially resumed Wednesday morning, but the snow did not wholly disappear for several weeks.

BLOAT, v. *blōt* [Icel. *blautr*, soft: Dan. *blöd;* Sw. *blot*, soft: *blöta*, to soften by soaking]: to cause to have an unsound swollen look; to swell; to puff up; to make vain; to make or grow turgid. BLOAT'ING, imp. BLOAT'ED, pp.: ADJ. having an unsound swollen look, as if soaked in water. BLOAT'EDNESS, n. the quality of having an unsound swollen look. BLOATER, n. a herring cured in smoke, commonly styled Yarmouth B., Yarmouth being the centre of the herring-curing industry.

BLOCH, *blōch*, MARCUS ELIESER: 1723–1799, Aug. 6; b. Anspach, Bavaria: ichthyologist. He grew up in extreme ignorance till 19 years old; then studied medicine, surgery, and natural history in Hamburg and Berlin; took his medical degree at Frankfort; and practiced in Berlin till his death. He is best known for his *Allegemeine Naturgeschichte der Fische* (12 vols. Berlin, 1782–95, with 432 colored plates), and his collection of fishes now in the Berlin zoological museum.

BLOCK, n. *blŏk* [F. *bloc*, a log or mass: W. *ploc*, a block: Gael. *bloc*, round: Dut. *blok:* Ger. *block*]: a thick log or mass; a heavy piece of timber or stone; any mass of matter; the massive piece of wood on which persons were beheaded;

any hindrance or obstruction; the piece of wood in which the wheels of a pulley run; a row of houses: V. to shut up; to stop; to obstruct. BLOCK'ING, imp. BLOCKED, pp. *blŏkt*. BLOCKHEAD, n. *blŏk'hĕd*, a stupid fellow; a dolt. BLOCK'ISH, a. dull; stupid. BLOCK'ISHLY, ad. *-lĭ*. BLOCK'ISHNESS, n. stupidity; dulness. BLOCK'LIKE, a. resembling a block or blockhead. BLOCK-TIN, n. pure tin in stamped bars or blocks; also an inferior variety of tin. When the metal is reduced from its ores, it is first poured into molds, and the ingots thus procured are heated to incipient fusion in a reverberatory furnace, when the pure tin first fuses, and is withdrawn; and the less pure tin left behind, being melted at a higher temperature, is poured into molds, and is known as block tin (see TIN): ADJ. denoting a vessel made of double or triple plates of tinned iron. BLOCK'HOUSE, n. a kind of fort chiefly constructed of hewn timber, loopholed for defense. BLOCK-SHIP, a vessel for the protection of a harbor—generally an old large one. Since war-steamers have almost superseded the old sailing men-of-war, the latter are of little service except as block-ships, or for training-ships. BLOCK-SYSTEM, the system of working a railroad when it is divided into sections of 3 or 4 miles, generally between stations, having at the end of each a signal and a connection with the electric telegraph, so worked that no train is allowed to pass into any one section till it is wholly clear—thus between two successive trains there is not merely an interval of time, but an absolute interval of space. See RAILWAYS (*Signals*). TO BLOCK OUT, to sketch out the whole roughly, as a plan.

BLOCK, in the rigging of a ship: an important part of the apparatus for raising sails and yards, tightening ropes, etc. The B. comprises both the frame or shell, and the pulley or pulleys contained within it. In seamen's language, a *tackle* includes the rope as well as the B. through which it works. The uses of blocks are very numerous on shipboard; and they are distributed about the masts, yards, sails, and ropes. They vary greatly in size, shape, power, and designation; but nearly every B. comprises a *shell* or wooden exterior, a *sheave* or wheel on which the rope runs, a *pin* or *axle* on which the sheave turns, and a *strap* (of rope or iron) to fasten the B. to any particular station (see PULLEY). A single B. contains only one sheave; a double B., two; and so on. Besides the designations of blocks according to the number of sheaves they contain (*single, double, treble, fourfold*), ships' blocks receive numerous other names—such as *bee-B., cut-B., cheek-B., clew-garnet B., clew-line B.*, etc. Some of these names depend on the kind of service, others on the place of fixing; while the rest are examples of the odd nomenclature adopted by seamen.

Block-making.—Ships blocks were made by hand until about a century ago. But mere workers in wood could not produce them; it required unusual skill and practice to fashion the several pieces, and put them together so as to

possess the requisite strength and facility in working. The trade was carried on alone, or with mast-making. More than 1,400 such blocks were required for one of the old 74's, and a proportionate number for vessels of larger or smaller size. 1808 the Brit. admiralty adopted Sir Mark Isambard Brunel's accurate system of B.-making by machinery. Recent improvements in blocks provide for decrease of friction: this is effected in one very large class by roller bearings. The hole through which the pin passes is considerably larger than the pin, and into the hole is inserted a roller bushing, which consists of a brass frame carrying generally 6, sometimes 8, rollers, which surround the pin and are parallel to it. Thus as the sheave turns, the rollers turn with it, rolling friction takes the place of sliding friction, and the sheave turns much more readily. In other systems anti-friction compositions are used to avoid friction. Instead of wooden shells for blocks, metal ones, often of open work, are often used. Instead of rope straps, iron straps are now generally used.

BLOCKADE, n. *blŏk-kād* [It. *bloccare*, to block up: Sp. *bloquear*, to blockade—from BLOCK, which see]: the surrounding or shutting up any place with a sufficient number of soldiers or ships, in order to prevent any intercourse with its inhabitants: V. to shut up a town or a fortress with an army or with ships, to compel its surrender. BLOCKA′DING, imp. BLOCKA′DED, pp. TO RAISE A BLOCKADE, to withdraw, or to force or drive away, the troops or ships from their positions.

BLOCKADE′, in a Military Sense: operation for reduction of an enemy's town or fortress, often without bombardment or regular siege, by preventing introduction of supplies or reinforcements. Every avenue of approach is guarded by the attacking force, which erects works on neighboring heights and roads; and troops are held in reserve to repel sorties. When the officer in command of a post foresees B. immediately imminent, he sends out of the place as many of the non-combatants and ineffectives as possible, collects the stores in bombproofs, and subjects to military regulation the food supply. When the opposing force begins construction of the B. works, he endeavors by frequent sorties to hinder the investment of the place. The most notable instance on record of military B. was the investment of Paris by the German armies 1870–1. There the inevitable result of the absolute stoppage of supplies was hastened by bombardment. At Metz, in the same war, a great army comparatively unencumbered by presence of a civil population, was compelled to surrender under stress of B. only, without bombardment.—See SIEGE.

BLOCKADE, in a naval sense, is prevention of entrance or exit of the enemy's ships at a particular port, or at all the ports on a stretch of coast: ships of neutrals are prohibited from intercourse with the enemy through the same ports.

An attempt of a neutral ship to introduce supplies through a blockaded port, subjects the offending party to be treated as an enemy by the belligerent. But in order to create an obligation on the part of neutrals to abstain from attempting to enter a port proclaimed under B., the B. must be 'effective'—*i.e.*, maintained by a force sufficient really to prevent access to the enemy's coast. It is a growing practice among maritime powers for belligerents to notify diplomatically to the neutral powers the fact that they have placed an enemy's port or ports under blockade. The act of sailing with intent to enter a blockaded port will warrant the capture of a merchant vessel by a belligerent cruiser on the high seas. A port having been placed under B., egress is prohibited to all neutral vessels, except such as entered before B. was established: even these must not take out cargoes, unless they were laden before the commencement of the B. The ancient usage was to confiscate both ship and cargo in case of breach of B., and to treat the crew as enemies; but now a milder practice generally prevails as regards captain and crew; often, too, a ship may be condemned, while her cargo may be released.—The most memorable of recent blockades is the B. of the ports of the s. states by the U. S. govt. during the civil war. The effect of this B. on prices in the south and in England was remarkable; cotton bought in Wilmington, N. C., at 4 cents a lb., sold for 60 cents in Liverpool. See CHARLESTON: NEUTRALITY: PRIZE COURT. For the law of B., consult Twiss, Hall, Phillimore, Hazlitt, Taylor and Wheaton.

BLOCK-BOND: in *bricklaying*, an arrangement in which 'headers' and 'stretchers,' or bricks laid lengthwise and crosswise, succeed each other in alternate courses.

BLOCK BOOKS: see PRINTING.

BLOCK COAL: peculiar kind of coal occurring in the coal fields of Indiana. It breaks easily into large square blocks. In the smelting of iron, it is used either directly or coked.

BLOCK'HOUSE: kind of fort of logs or timber, built usually within a field fortification, thus providing a *keep* or place to which the defenders may retire for protection and to protract their resistance. In plan a B. may be square, rectangular, or even cruciform, according to locality and to the kind of fire that it is to deliver. The walls are usually of two rows of logs, the inner placed vertically, the outer horizontally and hewn so as to have a surface of contact of at least 8 inches. If intended to withstand artillery, these rows would be about 3 ft. apart, the space between them being filled with earth closely rammed. The roof is usually of logs laid horizontally, boarded so as to be water-tight, and covered with 3 or 4 ft. of earth, so as to make it fire-proof and splinter-proof. A B. within a field fortification should be so placed that all parts of the interior of the fortification may be commanded by, and seen from, the B. Its size depends on the number

of defenders to occupy it. It should be free from dampness and well ventilated, and strong enough to resist the fire to which it is liable; a thickness of 40 inches is required to resist projectiles of field guns. Where not liable to artillery fire, the B. would usually have two stories, the sides of the upper story overhanging, or making an angle with those of the lower, so as to allow all parts of the building to be protected by its own fire. The walls are provided with loopholes for infantry fire, and with embrasures for cannon, where these are used. Additional protection is obtained for the walls by banking them with earth. Blockhouses were much used in the United States for defense against Indians. In a wooded country they are easily and quickly constructed; and, in connection with stockades (similar structures without roofs), they form an efficient protection, capable of accommodating a large number of defenders.

BLOCK ISLAND, formerly MAN'ISEES: in the Atlantic, about 9 m. s. of the mainland; about 8 m. long, 5 m. wide; constitutes the town New Shoreham, Newport co., R. I. Numerous visitors resort there in summer. E. of the island is an extensive breakwater, forming a harbor of refuge. A light house stands at the n.w. end, in 41° 13′ n., 71° 35′ w. Pop. (1890) 1,320; (1900) 1,306.

BLOCK SYSTEM: a method of directing the movement of railway trains so that only one train shall be in a block (or section of a track) at one time. A block may be a fraction of a mile or several miles long, the operation being the same. The theory involved is that every train before entering a new block shall have positive information that no other train is in that block. The principal systems may be divided into—1, telegraphic; 2, controlled manual; 3, train-staff; 4, electric automatic.

The *telegraphic system* is practical only by making the blocks the distance between stations, as it requires a telegraphic outfit for its operation. In some instances, however, the same system is worked by telephone. The operators at the stations are in constant telegraphic communication, and no train must be permitted to go past a station until the operator at that station sets the 'all clear' signal. This signal is usually a semaphore, that is an upright post, with one of more swinging arms, to which lanterns are attached at night. The position of an arm which may be up, out, or inclined, gives information to the engine-driver. On different railways the positions of the semaphore arms are sometimes differently interpreted. There are often two of these semaphores, the one before a block being called the distance signal, and the one at the entrance to the block the home signal. The distance signal when set to read 'caution' advises the engine-driver to slow up, as he may have to stop at the home signal.

In the *controlled manual* system, also called the 'lock and block' system, electric mechanism is employed by which signalmen at both ends of the block have to send in their consent before the signals can be set to permit a

train to enter. This system is used on a number of important American railways, and on some British roads.

The *train-staff* system is used largely on single-track roads, where trains run in opposite directions on the same track. Head-on collisions have to be guarded against. A staff twenty inches long is handed to the engine-driver when his train enters a block, and no other train is allowed in that block until this staff is returned to a station at one end of the block. The staffs are kept in magazines at each end of the block, and when one is taken out it locks both magazines (the distant magazine being electrically closed) and only on depositing a train-staff can either of the magazines be opened again. This system is modified in some cases by semaphore signals that permit a train to follow another into a block at a certain distance.

Automatic block signals are operated by electromagnets. The rails are used to convey an electric current through the length of a block. The semaphore signals at the ends of the block stand at horizontal to signify 'all clear,' but when a train passes into the block it connects the two tracks and the current is carried off, so that the electromagnets cease to hold up the semaphore-arm and it drops of its own weight, signaling 'stop.'

When blocks are several miles in length permissive block signaling is practiced, in which a train is allowed to run into a block behind another, but under control, that is moving slowly.

Where blocks are very short, as on a city railway, block signals are sometimes supplied with an attachment that strikes a device on the locomotive and sets the air-brakes.

The first B. S. in the United States was introduced by the Pennsylvania Railway Co. in 1876; they had been previously used in Europe. In 1906 nearly one-fourth of the United States trackage was protected by some form of B. S. English railways use the B. S. on all lines, the telegraphic system being preferred. See RAILWAY.

BLODGET, *blŏj'ĕt*, LORIN, American statistician: b. near Jamestown, N. Y., 1823, May. 25; d. Philadelphia, 1901, March 24. He was educated at Hobart College; appointed assistant professor at the Smithsonian Institution, Washington, D. C., in charge of researches on climatology, 1851; was employed on the Pacific Railroad survey for the War Department, 1852–6; and was engaged in the United States treasury department, 1863–77. He was also editor of the Philadelphia *North American*, and secretary of the board of trade of that city, 1858–64. He is credited with having laid the foundation of American climatology. His publications include *The Climatology of the United States* (1857), a work that met high favor in the United States and Europe; *Commercial and Financial Resources of the United States;* and about 150 volumes of reports.

BLOD'GETT, *bloj'ĕt*, HENRY WILLIAMS, American jurist: b. Amherst, Mass., 1821, July 21; d. Waukegan,

Ill., 1905, Feb. 9. He was educated at Amherst Academy; studied surveying and engineering; was admitted to the bar in 1844; and settled in Waukegan, Ill., to practise, in the following year. He served in the lower house of the legislature, 1852–4, and in the State Senate, 1859–65; and was United States district judge for the Northern District of Illinois, 1869–93, when he retired. He was appointed one of the counsel on the part of the United States before the arbitration tribunal on the Bering Sea fur-seal controversy between the United States and Great Britain, in 1892.

BLODGETT, SAMUEL, American inventor: b. Woburn, Mass., 1724, April 1; d. Haverhill, Mass., 1807, Sept. 1. He took part in the French and Indian war; was a member of the expedition against Louisburg in 1745; and subsequently became judge of the court of common pleas in Hillsboro County, N. H. He was the inventor of an apparatus by which he recovered a valuable cargo from a sunken ship near Plymouth, Mass., in 1783. His success led him to go to Europe for similar enterprises. He met with no encouragement in Spain, and in England proposed to raise the Royal George, which went down off Spithead with 800 persons on board, but his proposition was not accepted. In 1793 he began the construction of the canal around Amoskeag Falls in the Merrimac which now bears his name, but did not live to complete the work.

BLOEDE, *blö'dė*, GERTRUDE, American poet and novelist, better known as STUART STERNE: b. Dresden, Saxony, 1845, Aug. 10; d. Baldwin, L. I., 1905, Aug. 14. She wrote in verse *Angelo* (new ed. 1879); *Giorgio and Other Poems* (1881); *Beyond the Shadow, and Other Poems* (1888); *Piero da Castiglione;* and *The Story of Two Lives*, a novel.

BLOEMFONTEIN: city and cap. of the Orange River Colony (name changed from Orange Free State by the British 1900, May 29), South Africa; on the Modder river, 200 miles w. by n. of Durban. It is built on an elevated site, and is connected with Natal and Cape Colony by telegraph. During the war between England and the Transvaal and the Orange Free State in 1899–1901 it was an important military post. When Lord Roberts was placed in supreme command of the British forces in South Africa he led an expedition against Bloemfontein, which surrendered, 1900, March 13, President Steyn escaping capture. Soon afterward the part of the republic held by the British was placed under British administration. The city is the seat of an Anglican bishopric.

BLOIS, *blwâ:* town of France, cap. of the department of Loire-et-Cher. It has a remarkably fine situation on the acclivity of a hill, and is built chiefly on the right bank of the Loire, about 35 m. s.w. of Orleans. The houses, in the upper part of the town especially, are mean and ill built, and the streets are crooked and narrow, but they are kept clean by water from the public fountains, which are sup-

plied by a fine aqueduct, supposed to have been constructed by the Romans. B. has a handsome cathedral; but its chief glory is its old castle, scene of many interesting historical events. Louis XII. was born in it, and under its roof Charles, Duc d'Alençon, and Margaret of Anjou, and Henry IV. and Margaret of Valois were married. Here also were sometimes held the courts of François I., Henry II., Charles IX., and Henry III. Here also the Duc de Guise and his brother were murdered, by order of Henri III., 1588, Dec. 23. Isabella, queen of Charles VI., here found a retreat; it served as a prison for Mary de' Medici; Catharine de' Medici died within its walls; and Maria Louisa here held her court in 1814, after Paris had capitulated. B. is a place of great antiquity. Stephen, who usurped the crown of England on the death of Henry I., was a son of one of the counts of B., by Adela, the daughter of William the Conqueror. B. is an archbishop's see, has a tribunal of commerce, a communal college, a large public library, a botanic garden, etc., and manufactures of porcelain and gloves, with a trade in brandy, wine, and wood. Pop. (1891) 23,457; (1896) 23,542.

BLOK, Petrus Johannes, Dutch historian: b. Helder, 1855. He was educated at Leyden; in 1884 became professor of history at Croningen and later at the University of Leyden. He was also Queen Wilhelmina's tutor in history. His work has been chiefly in social-political history of the Netherlands. He is the author of *History of the People of the Netherlands* (translated into English); *Eene Hollandsche stad in de Middeleuwen* and *Eene Hollandsche stad onder de Bourgondisch-Oostenrijksche Heerschappy.*

BLOMARY, Bloomary, or Bloomery, *blôm'a-rĭ* [A. Sax. *blôma,* a mass of metal]: a kind of furnace for reducing iron ore, in use from remote times and among rude peoples as well as those highly civilized. Diodorus Siculus describes such a process used in the island of Elba. The ruder forms are small open pits of clay or earth with openings in the side, tuyeres, for the passage of air-blast from the bellows. The Catalan furnace, used in Spain and s. France, is an improved form; it has a hearth of heavy iron plates at the bottom of a pit 2 ft. or less in depth, 3½ ft. long, 2½ ft. wide, or smaller. Ignited charcoal and broken ore are heaped up in this, more charcoal and fine ore being thrown on during the process, which lasts about six hours; then the *loup,* or mass of iron collected at the bottom, is taken out and freed from dross by forging it into a *bloom* of malleable iron.—The German B., used in n. Europe, is an iron pot or a box of iron plates, lined with fire-bricks, 1 to 2 ft. in diameter and in depth. The furnace is first heaped up with charcoal ignited, unmixed with ore; then the ore, previously made fine, is thrown on top, a small quantity at a time, producing a loup and a bloom as above. Early in the last c. the German B. was introduced into America, and is still used, especially in n. New York,

in improved forms called the B. fire, the Jersey forge, the Champlain forge, or sometimes (improperly) the Catalan forge. The Rev. Jared Elliot, 1762, treated black sands from Killingworth, Conn., in a B., and the blooms were made into fine steel; for the discovery he received a medal from the London Soc. of Arts. Now the old cold blast is replaced by a hot blast, and various other improvements have been made. Still the richest ore must be used, and at best there is great waste, much iron being lost in the slag. One and a half to two tons of rich ore will reduce to one ton of bloom, two tons or more of charcoal being consumed in the process. The heat in the B. is usually not sufficient nor intended to fuse the metal; the ore is simply 'reduced,' and the metal collects without melting. The B. requires very small outlay for the plant, and produces a fine quality of metal. However, it has given place for the most part to the regular blast furnace.

The name B. is given also to a similar furnace for converting cast-iron into malleable iron.

BLOMFIELD, *blŭm'fēld,* Charles James, Bishop of London: 1786–1857, Aug. 5; b. Bury St. Edmund's, Suffolk, where his father was school-master. Being well grounded by his father in the classics, B. went to Cambridge, where he took high honors. After he had filled several curacies, the Bp. of London appointed him his chaplain in recognition of his acknowledged philological and theological acquirements. Soon, he was called to the living of St. Botolph; in 1824, he was made Bp. of Chester; and in 1828, he was promoted to the see of London, on the translation of Bp. Howley to Canterbury. B's reputation for classical scholarship rests chiefly on his editions of *Callimachus* (Lond. 1815), and of several of the dramas of *Æschylus.* In connection with Rennel, he published the *Musæ Cantabrigienses;* and with Monk (1812), the *Posthumous Tracts of Porson;* and 1814, the *Adversaria Porsoni.* He published also *Lectures on the Acts of the Apostles.* B. was exceedingly active in the superintendence of his diocese, and was a prime mover in the agitation for the erection of new churches. Under his presidency, more churches were erected in London than under any bishop since the Reformation. His conduct in regard to the controversies that latterly agitated his diocese was much animadverted on by both parties. Accused at one time of leaning to Puseyism, he yet proceeded against his clergy for ritualistic practices. See Memoir (new ed. 1864).

BLOMFIELD, Edward Valentine, English clergyman (brother of the preceding): b. 1788; d. October, 1816. He studied at Caius College, Cambridge, and excited the highest expectations. Among several prizes which he gained was a medal assigned him in 1809 for his beautiful ode *In Desiderium Porsoni.* In 1812 a fellowship in Emmanuel College was conferred on him. In 1813 he visited Germany, where he acquired a good knowledge of the German language, and became acquainted with

Wolf in Berlin, and Schneider in Breslau. After his return he wrote in the *Museum Criticum* or *Cambridge Classical Researches*, remarks on German literature which were received with approbation. The University of Cambridge appointed him one of the preachers of St. Mary's Church. He began a translation of Schneider's *Griechisch-Deutches Lexicon*, but did not live to finish it. Matthiæ's *Griechische Grammatik*, however, he translated completely. His translation was published by his brother and was everywhere well received. He was in Switzerland in 1816 with his pupil, a young nobleman, and in his haste to return to Cambridge on hearing that he was appointed proctor for the following year the fatigue of rapid traveling occasioned a sickness of which he died.

BLOMFIELD, Reginald, English architect: b. 1856, Dec. 20. He was educated at Exeter College, Oxford. He is architect to the Army and Navy Society and among his many important professional works are *Brocklesby Park, Caythorpe Court, Holbrook House, New Buildings at Haileybury College, Lady Margaret Hall, Portsea Institute.* He has published *The Formal Garden in England* (1892); *A History of Renaissance Architecture in England*, two works of great value (1897); *Short History of Renaissance Architecture in England* (1900)

BLOMMAERT, *blom'mârt*, Philip: 1809, Aug. 24—1871, Aug. 14; b. Ghent: Flemish author. In 1834 he published a volume of verse, characterized by much simplicity and earnestness, but so inartistic in form that it had little success. He rendered better service to literature and to the patriotic cause by the publication (1836–41) of *Theophilus*, an old Flemish poem of the 14th c., and of the *Oudvlaemsche Gedichten* (Old Flemish Poems) of the 12th, 13th, and 14th c. Both works are enriched with glossaries and learned annotations. B. showed a predilection for middle-age literature generally, and translated the *Nibelungen* into Flemish iambics. His most important work is a History of the Belgians (Brussels, 1849), in which he attempts to show that the political destiny of the Low Countries has ever been identical with that of Germany, and that it is with the latter country, and not with France, she should seek to ally herself. B. also contributed extensively to several Belgian journals, especially to the *Messdger des Sciences Historiques.* He died at Ghent.

BLOND, a. *blŏnd* [F. *blond*, Sp. *blondo*]: of fair complexion and light-colored hair.

BLONDE, n. *blŏnd* [F. *blonde*, a fair woman]: a woman having a fair complexion and light hair, opposed to *brunette;* a kind of silk lace. Blond, a. *blŏnd*, fair; having a fair complexion.

BLONDEL, *blōn-dĕl':* celebrated French minstrel of the 12th c., the favorite of Richard the Lion-heart, King of England, whom he accompanied to Palestine. When Richard, on his return, was seized and imprisoned by

Leopold, Duke of Austria, B. (according to the exquisitely romantic myth of an old chronicler) resolved to find out the place in which his master was confined. He wandered through Germany in disguise; and at length coming to the castle of Lowenstein, in Austria, he heard that it contained some illustrious captive. Feeling assured that this was no other than the king, he tried all means to get a sight of him, but to no purpose. He then placed himself opposite to the tower in which he learned the unknown was imprisoned, and commenced singing one of those Provençal songs which Richard and he had composed together. Hardly had B. finished the first stanza, when a well-known voice from the tower took up the second, and carried it on to the end. So the minstrel discovered his monarch, and was the means of his being ransomed by his subjects. This remarkable feat gained him the name of the 'faithful Blondel.' Grétry's fine opera, *Richard Cœur de Lion*, is founded on this anecdote. Blondel's poems were published by Prosper Tarbé under the name of *Les Œuvres de Blondel de Néelle* (Rheims 1862).

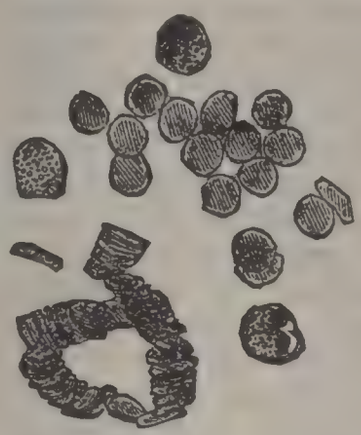
BLONDIN, Charles Emile Gravelet, *shârl ā-mēl grâv-lā blŏn-dăn*, French acrobat: b. St. Omer Pas-de-Calais, 1824; d. London, 1897, Feb. 22. He was trained at Lyons, where he made such rapid progress that he was designated 'The Little Wonder.' After making a several years' tour of the United States, on 1859, June 30, before a crowd of 25,000 persons, he crossed the Falls of Niagara on a tight-rope in five minutes; on July 4, he crossed blindfold, trundling a wheelbarrow; on August 19 he carried a man on his back; on 1860, Sep. 14, he crossed on stilts in the presence of the Prince of Wales. His engagement at the Crystal Palace in 1862, where he performed on a rope 249 yards long and 170 feet from the ground, drew immense crowds. After several years' retirement he reappeared in 1880, and in 1888 again performed in London, where he died.

BLOOD, n. *blŭd* [AS. *blod;* Dut. *bloed;* Ger. *blut*, blood —as connected with Dut. *bloedsel;* OE. *blooth;* Ger. *blüthe*, a blossom, a flower, from their generally bright color: Ger. *blühen*, to glow—*lit.*, a fluid of a bright glowing color]: the red fluid which circulates through the veins and arteries of animals, essential to life; kindred; honorable birth or extraction: V. to stain with blood; to let blood; to bleed; to give a taste of blood, or to provoke the desire for it; to heat or exasperate. Blood'ing, imp. Blood'ed, pp. Blood'less, a. *-lĕs*, without blood; lifeless; inactive. Blood'lessly, ad. *-lĭ*. Blood'y, a. *-ĭ*, stained with blood; cruel; murderous. Blood'ily, ad. *-ĭ-lĭ*, with the disposition to shed blood; cruelly. Blood'iness, n. state of being bloody; disposition to shed blood. Blood bought, a. purchased by shedding blood. Blood-brother, n. a brother by blood, as contradistinguished from a brother-in-law, brought into that relation by marriage. Blood-guiltiness, n. crime of shedding blood. Blood horse, one of a full or high breed; a thoroughbred horse. Blood-hot, of the

same heat as blood. BLOOD-HOUND, a hound for tracking human beings by scent; a hunter after human blood. BLOODLETTER, one who lets blood. BLOODLETTING, act of one who lets blood. BLOOD ROOT, a plant of the ord. *Hæmodorāceæ*, so named from the red color of its roots, which are used in dyeing; also applied to a plant of the *Poppy* order, having a red juice. BLOOD-SHED, n. waste of life. BLOOD'SHEDDER, n. one who. BLOOD'SHEDDING, n. act of shedding blood. BLOOD'SHOT, a. red; inflamed. BLOOD-STAINED, a. stained with blood; guilty of murder. BLOODSTONE, a variety of chalcedony of a dark-green color, sprinkled with deep red spots—also called *heliotrope*. BLOOD-SPAVIN, a distemper in horses, consisting of a soft swelling growing through the hoof, and usually full of blood. BLOOD'SUCKER, n. any animal that sucks blood, as a leech; a cruel man. BLOOD'THIRSTY, a. cruel; murderous. BLOOD-VESSEL, a vein or artery. BLOODY-FLUX, the disease called *dysentery*, in which the discharges from the bowels have a mixture of blood. BLOODY-SWEAT, a sweat accompanied with a discharge of blood; a disease called the sweating sickness. FLESH AND BLOOD, human nature; mortal man. COLD BLOOD, free from excitement or passion. COLD-BLOODED, a. cool and calculating, used in a bad sense; not having warm blood. HOT-BLOOD, in a state of excitement and blind fury. HOT-BLOODED, a. very impulsive; fiery. PRINCE OF THE BLOOD, one of royal descent. BIT OF BLOOD, a high or well-bred animal. BLOODY-HAND, symbol of a baronet. BLOODY ASSIZES, the assizes or court held in 1685 by the infamous Judge Jeffreys, by whose sentence some 300 were hanged, 1,000 sent to slavery in the colonies, and many whipped and imprisoned—all with a mere show of a trial. *Note.*—BLOODY, this OE. word, and now only low vulgarism, in the sense of 'a bit; half; very much; excessive'—as 'bloody fool' = a bit of a fool; very much a fool—'bloody strange' = very strange; rather strange, is really a different word from that given in the text. It is not likely that writers such as Dean Swift and the poet Gray, would have written, 'It grows *bloody* cold,' 'a *bloody* satire,' if the present sense of a sanguinary character had been exclusively attached to it in Swift's time. Indeed, the alternative, innocent sense is very old. The etymology may be found in such a form as 'Gael. *bloide*, a piece.'

BLOOD: the nutritive fluid of the tissues, circulating through the veins and arteries of animals. It consists of a transparent colorless fluid, the *liquor sanguinis* or plasma, and minute solid bodies, the *corpuscles* and the platelets, which float in it. The liquor sanguinis consists of water, in which are dissolved fibrin, albumin, chlorides of sodium and potassium, phosphates of sodium, calcium, and magnesium, together with fatty and extractive matters, the latter product of the metamorphosis of the tissues. The corpuscles are of two kinds—white and red; the *white* corpuscles are larger and less numerous than the

red, being in healthy blood in the proportion of 2 or 3 to 1,000. There are four varieties of leucocytes, as the white corpuscles are called: (1) lymphocyles; (2) polymorphonuclear leucocytes, (3) eosinophil leucocytes, and (4) basophil leucocytes. The first of them have a non-granular protoplasm and a globular nucleus; the second have a finely granular protoplasm with irregular nucleus; the third have a coarsely granular protoplasm which is readily colored with acid stains; the fourth have granulas in the protoplasm which stain with basic dyes. There is a fifth variety, called myelocytes, which are seldom if ever seen in healthy blood, but only when there is a disease of the bone marrow. The basophil leucocytes are also seen but rarely in health. In certain forms of disease the number of these white blood-corpuscles is increased, and the relative preparation in the numbers of the different varieties is also changed in disease. Under the microscope they are seen to vary in form in the same way as the Amœba (see PROTEUS); hence these movements are called *ameboid*. The red are oval and nucleated in fishes, reptiles, and birds, but in man and the mammalia generally they are non-nucleated, and are biconcave flattened discs, their edges being thicker than the centre, hence the dark appearance of the latter when seen under the microscope. They have a great tendency to turn on their side and run into rouleaux, like piles of coins. Their color is straw-yellow, and it is only when seen *en masse* that they give the blood its characteristic red color. The size of the human red blood-corpuscles is 7.6 micromillimetres (1-3300 inch). They are largest in reptiles, those of the Proteus (q.v.) being 1-400 of an inch in their long diameter. There are in health from 4,500,000 to 5,000,000 in each cubic millimetre of blood. Hoppe-Seyler has shown that, chemically, they consist chiefly of hemoglobin (the coloring matter), cholesterin, lecithin, and phosphate of potassium, but no fat. The platelets are small grayish bodies, about 1-3 the size of a red corpuscle, concerning the origin and nature of which little is known. The specific gravity of B. is 1.052 to 1.057, and its *mean* quantity is from 1-20 to 1-13 the weight of the body. On evaporation as a whole, the B. yields 790 parts in 1,000 of water and 210 of solid residue, which residue has nearly the same ultimate chemical composition as that of muscular tissue. When B. is set aside for a time, occasionally crystals of hematoidin appear. The B. crystals of man and the carnivora have a prismatic form, while those of the rat and mouse are tetrahedral, and those of the squirrel hexagonal (Carpenter).



Blood-corpuscles highly magnified.

Coagulation of the Blood.—When B. is drawn from the vessels, the liquor sanguinis separates into two parts,—into fibrin, which becomes solid, and a pale yellowish colored liquid, *serum*. The fibrin coagulates, and in doing so entangles the corpuscles, and forms a red mass, the clot (*crassamentum*). Fibrin does not exist in the B. as such, but when it appears as a coagulum in a fluid, it is produced then and there by the union of two substances present in the blood which separate as a solid matter (Schmidt)—the one, thrombin, an enzyme, may be present in solution in the plasma, but is certainly contained in the blood-corpuscles; the other, fibrinogen, is a globulin existing in the plasma, the two uniting to form the fibre of the clot. The rapidity with which this change takes place varies with circumstances. Moderate heat and exposure to the air favor it; cold and exclusion from the air retard it. The presence of lime salts is necessary, but the addition of chloride of sodium in excess prevents coagulation. Blood drawn into a vessel containing oil will not coagulate for a long time. The B. remains fluid in the veins for some time after death. In glanders and some forms of malignant fever, and when the B. is *poor*, as in scurvy, it may remain fluid. The size and firmness of the clot depend on the amount of fibrin developed from fibrinogen in the B., which in health averages about two parts in 1,000. In inflammations it is much increased, and the B. forms slowly into a tough clot, almost destitute of red globules on its surface, and drawn in toward the centre. This colorless layer is termed the *buffy coat*, and the physicians of bygone times used to attach great importance to it, believing that it was a phenomenon peculiar to inflammation. The color of the B. varies. In the arteries it is of a bright scarlet color, while in the veins it is of a dark-purple color. The chief difference between arterial and venous blood is that the former contains more oxygen and less carbonic acid than the latter. See CIRCULATION OF THE BLOOD.

The changes in color can be effected in B. drawn out of the body by the application of the gases mentioned. The red blood-corpuscles possess great powers of absorbing oxygen. They receive oxygen in the lungs and carry it all over the body to the tissues to form new combinations. After a time, the corpuscles become dissolved in the liquor sanguinis. The products of the metamorphosis of the tissues are poured into the B., so that is it really a very complex fluid. See RESPIRATION.

BLOOD AND BLOOD EXAMINATIONS: See HEMATOLOGY.

BLOOD-ACCUSATION: The origin of the accusation that Jews employ Christian blood for ritual purposes and commit even murder to obtain it, is of uncertain date. Although such a procedure is wholly opposed to Jewish law and custom which under no condition favor the use of blood for any purpose, and Christian potentates and eminent scholars have protested against such a perversion of

Jewish doctrine and practice, the charge which dates from the early Middle Ages is still maintained where popular ignorance and prejudice are in force. A world-wide myth is doubtless at the basis of the accusation, which was levelled against the Christians in the early centuries by their heathen foes and has been recently repeated in China against Christian missionaries. In the 12th c. accusations were frequent, particularly as the concomitant of the Easter festival, which occurring at the time of the Jewish Passover found a soil prepared for religious hatred on the part of the superstitious populace. Instances like William of Norwich (1144), and elsewhere in England in the same century, at Blois (1179), at Fulda (1235); in Vaucluse, France (1247), Little Hugh of Lincoln (1255), referred to by Chaucer; Simon of Trent (1475); near Toledo, Spain (1490), employed by Lope de Vega as basis of a play; these are a few of the notable cases of the blood-accusation in the early Middle Ages. The persistence of the charge of the nineteenth century is proved by the Damascus incident (1840), by the Tisza-Eszlar affair (1882), Corfu (1891); Xantes, Prussia, (1891); Polna, Bohemia (1899). While many factors enter into the blood-accusation, such as the general belief in the efficacy of blood, the association of the Passover bread with the wafers used at the Christian communion, the employment of red wine at the Passover festival, &c., there is little doubt that the persistence of the change is due chiefly to popular ignorance of the Jew and Judaism, owing partly to the enforced seclusion of the Jew and religious hatred so manifest in the Middle Ages against him which is still latent wherever the mediæval spirit is preserved.

No pope has ever sanctioned the blood-accusation; many condemn it, while prominent converts have written against the charge, the most notable being the protest in 1840 signed by Bishop Alexander of Jerusalem and 57 others who were formerly Jews, which thus reads: 'We, the undersigned, by nation Jews, and having lived to years of maturity in the faith and practice of modern Judaism, but now, by the grace of God, members of the Church of Christ, do solemnly protest that we have never directly or indirectly heard, much less known, among the Jews, of the practice of killing Christians or using Christian blood, and that we believe this charge, so often brought against them formerly, and now lately revived, to be a false and Satanic falsehood.' Among the monarchs who have condemned the charge were the German Emperor Frederick II., Rudolph of Habsburg, Frederick III., Charles V. (1236 to 1544); Bohemian and Polish Kings (1254 to 1576); while such Christian scholars and theologians as Wagenseil (1633-1708), Schudt (1714), Semler (1725-91), and more recently Franz Delitzsch, Döllinger, Strack. See Jacobs, *Jews of Angevin England*, Chwolson, *Blutanklage* (1901), Strack, *Das Blut im Glauben und Aberglauben der Menschheit* (1900).

BLOOD, Avenger of: one who anciently had the duty of pursuing and slaying a murderer. In the early ages of society, the infliction of the penalty of death for murder did not take place by the action of any tribunal or public authorities administering law, but in accordance with the rude social condition, was left to the nearest relative of the murdered. He was called the avenger of B., in Hebrew, *Goël*, which term, however, was of much wider signification. The Mosaic law (Num. xxxv.) did not set aside this universal institution of primitive society, but placed it under regulations, prohibiting the commutation of the penalty of death for money, which appears to have become frequent, and appointing *cities of refuge* for the manslayer who was not really a murderer: see City of Refuge. The Koran sanctions the avenging of B. by the nearest kinsman, but also sanctions the pecuniary commutation for murder. The primitive institution or custom subsists in full force among the Arabs at this day. Many of the hereditary feuds of families, clans, and tribes in all barbarous and semi-barbarous countries, have always been connected with the avenging of blood.

BLOOD, Corruption of, in Law: see Treason.

BLOOD, Eating of: an offense under the Mosaic law; prohibited obviously for reasons connected with the use of animals in sacrifice. Christians, with a few exceptions, have always regarded the prohibition as having ceased with the sacrifices which gave occasion for it; and the exhortation of the apostolic council of Jerusalem to the Gentile converts to abstain 'from things strangled and from blood,' has been almost universally viewed as merely an application of the great law of Christian charity to the circumstances of a transition period, with reference to the prejudices of Jewish converts.

BLOOD, Thomas: abt. 1618–80; b. Ireland, where he served in the parliamentary army: daring and successful adventurer. After the Restoration, he put himself at the head of an insurrectionary plot, which was to begin with the seizure of Dublin Castle, and of Ormond, the lord-lieut. On its timely discovery, he fled, while his chief accomplices were seized and put to death. Escaping to Holland, he was received there with high consideration. He soon found his way back to England, to try what mischief might be brewed among the fifth-monarchy men. Finding no prospect of success, he went to Scotland, invited by the turbulent state of affairs, and was at the fight of Pentland, 1666, Nov. 27. On the night of 1670, Dec. 6, the Duke of Ormond was seized, in his coach in St. James's Street, London, by a gang of bravoes, tied on horseback behind one of them, and hurried away toward Tyburn. The timely approach of his attendants at the moment that he had succeeded in struggling with his riding-companion to the ground, probably saved him from hanging. The leader in this daring villainy was B., and so well had he contrived it, that he did not even incur suspicion. His

next enterprise was still more wild and dangerous. On 1671, May 9, disguised as a clergyman, and with his former accomplices, he entered the Tower with the determination to carry off the regalia of England. After nearly murdering the keeper of the jewels, he actually succeeded in carrying off the crown under his cloak, while one of his associates bore away the orb. They were immediately pursued, however, seized, and committed to the Tower jail. Now came a singular turn of fortune. At the instigation of Buckingham, who was accused of having hired B. to attack the Duke of Ormond, King Charles visited the dauntless miscreant in prison, and, dreading the threat that there were hundreds of B.'s associates banded together by oath to avenge the death of any of the fraternity, pardoned him, took him to court, gave him an estate of £500 a year, and raised him so high in favor that for several years Colonel B. was an influential medium of royal patronage. This scandalous disregard of public decency was heightened by the fact that the old jewel-keeper, who had risked his life in defense of his charge, applied in vain for payment of a small reward for his devotion. After the fall of the 'cabal' ministry, B. became hostile to Buckingham, and for a scandalous charge against him was committed to prison. He was bailed out, and died in his own house.

BLOOD-BIRD of southern Australia (*Myzomela sanguinolenta*): beautiful little species of Honey-eater (q.v.), which receives its name from the rich scarlet color of the head, neck, breast, and back of the male. It inhabits thickets. A very similar species is found in Bengal.

BLOOD-BOLTERED, a. *blŭd-bōlt'ėrd* [OF. *bloutre*, a clod: Sw. *plotter*, a small portion: Dan. *bultred*, rugged]: in *OE.*, matted or clotted with blood. *Note.—Boltered* is connected with *ball*, as the snow *balling* in horses' feet, that is, forming into lumps or small *balls*. The OE. *baltered*, from *ball*, is apparently the older form.

BLOOD-FLOWER (*Hæmanthus*): genus of bulbous-rooted plants, of nat. ord. *Amaryllideæ* (q.v.), mostly natives of s. Africa, some of which are among the prized ornaments of green-houses. They take their name from the usual color of their flowers which form a fine head or cluster, arising from a spathe of a number of leaves. The fruit is a berry, usually with three seeds. The leaves of the different species show considerable diversity of form, in some almost linear, in others almost round; in some also they are erect, in others, appressed to the ground. The bulbs of some of the finest species of B., being very slow to produce offshoots, a curious method of propagating them is resorted to by gardeners, which is occasionally practiced also with other bulbous-rooted plants, by cutting them across above the middle, upon which a number of young bulbs form around the outer edge. The species of B. seem generally to possess poisonous properties. The inspissated juice of *H. toxicarius* is used by the natives of s. Africa for poisoning their arrows.

BLOOD'-HOUND: a variety of hound (q.v.) remarkable for its exquisite scent and for its great sagacity and perseverance in tracking any object to the pursuit of which it has been trained. It derives its name from its original common employment in the chase, either to track a wounded animal or to discover the lair of a beast of prey. It was also formerly called, both in England and Scotland, *sleut-hound* or *sleuth-hound*, from the Saxon *sleut*, the track of a deer. The B. was formerly common and much in use in Britain as well as on the continent of Europe, but is now rare. The poetical histories of Bruce and Wallace describe these heroes as occasionally tracked by blood-hounds, when they were skulking from their enemies. The B. was at a later period much used to guide in the pursuit of cattle carried off in Border raids: it has been frequently used for the pursuit of felons and of deer-stealers; and formerly, in the United States, for the capture of fugitive slaves, an employment which has tended to render its name odious. Terrible ideas are also, probably, suggested by the name itself, although the B. is by no means a particularly ferocious dog, and when employed in the pursuit of human beings, can be trained to detain them as prisoners without offering to injure them. The true B. is taller and also stronger in proportion, and of more compact figure, than a fox-hound, muscular and broad-chested, with large pendulous ears, large pendulous upper lips, and an expression of face variously described as 'thoughtful,' 'noble,' and 'stern.' The original color is said to have been a deep tan, clouded with black. The color appears to have been one of the chief distinctions between the B. and the Talbot (q.v.), but it is not improbable that this name was originally common to all blood-hounds. Many interesting anecdotes are recorded of the perseverance and success of blood-hounds in following a track upon which they have been set, even when it has led them through much-frequented roads.—The CUBAN B., much employed in the pursuit of felons and of fugitive criminals in Cuba, differs considerably from the true B. of Europe, being more fierce and having more resemblance to the bull-dog, and probably a connection with that of some similar race. Many of these dogs were imported into Jamaica, 1796, to be employed in suppressing the Maroon (q.v.) insurrection, but the terror of their arrival sufficed without their actual employment. It was this kind of B. chiefly which was introduced into the former slave-states.

BLOOD-LETTING: see BLEEDING.

BLOOD-MONEY: in English Law, formerly, money obtained by informers against great criminals for supporting a capital charge; now applied to reward earned by one who exposes his accomplices in crime, or in general to any act of treachery.

BLOOD-MONEY, in pagan times and nations the compensation paid by one who killed a man to the next of kin of the man slain, whereby the slayer and his kindred were

secured from retaliation. Often the amount was fixed by law. The Arabs still have this custom.

BLOOD OF OUR SAVIOR: order of knighthood in Mantua, instituted by Duke Vincent Goncaga 1608, on the occasion of the marriage of his sons with a daughter of the Duke of Savoy. It consisted of 20 knights, the Mantuan dukes being sovereigns. The collar had threads of gold laid on fire, and interwoven with the words *Domine probasti.* The name originated in the belief that among the relics shown in St. Andrew's Church, Mantua, are some drops of Christ's blood.

BLOOD OF ST. JANUARIUS: see JANUARIUS, ST.

BLOOD-POISONING: this was formerly a common affection and constituted one of the chief dangers of surgical operations or of accidental wounds, especially when treated in hospitals. Today, however, post-operation blood-poisoning is the worst of accidents, and it is as a sequel of some poisoned wound, especially a punctured wound, that the disease is chiefly run. A surgeon may acquire it as the result of an accidental puncture or wound in performing an operation in a 'septic' case, or in an autopsy on the body of one who has died from suppurative peritonitis or other septic disease.

There are three forms of blood-poisoning, called respectively: sapremia, or putrefactive products in the blood; septicemia, or septic germs in the blood; and pyemia or pus in the blood. These three forms resemble each other in their symptoms, though those of pyemia are usually the most severe. In sapremia and septicemia the first pronounced symptom is usually a sharp chill followed by fever, and then followed more or less rapidly in no regular interval, headache, nausea and vomiting, weakness of the pulse, and shortness of breadth. In pyemia the symptoms are the same, but frequent chills occur at irregular intervals, and the course of the fever is therefore eratic, the chart indicating the course of the suppurative changes being a zigzag line. The formation of albumen in various parts of the body is also one of the features of pyemia. The progress of pyemia is more grave than that of sapremia or septicemia, though all forms are serious. The wound should be exposed to the air and kept perfectly clean and freely drained. The diet should be of the most sustaining character, and heart tonics and stimulants may be called for.

BLOOD-RAIN: reddish and grayish dust, accompanied with moisture, sometimes falling in showers off the coast of Africa and on the land in the s. of Europe, in elevated regions falling as red snow. Such dust falls also without moisture. It consists mainly of microscopic organisms, mostly diatoms and rhizopods of many different species. The red color comes from oxide of iron. Like phenomena have appeared since Homer's time. Their origin is evidently not extra-terrestrial. Rains of this character occur in tropical countries where violent hurricanes fol-

lowing periods of drought carry the dust from dried lake bottoms and river-beds into the upper regions of the atmosphere. The zone having such showers extends on both sides of the Mediterranean, over the Atlantic, e. to central Asia.

BLOOD-RAIN is also a name given to a fermentation fungus, *Palmella prodigiosa*, producing red patches on dressed vegetables, bread, etc.

BLOOD-ROOT: see GEUM: HÆMODORACEÆ: SANGUINARIA.

BLOOD-STAINS, in Criminal Law: as bearing on the charge of murder. In many cases they can be scientifically detected and distinguished from other stains. The first question to be determined is whether the suspected stain is blood of any animal; secondly, is it human blood or that of a lower animal. To determine the first question certain tests have been devised. These are (1) the guaiac test, by which blood brought in contact with tincture of guaiac and hydrogen peroxide develops a blue color (not, however, conclusive); (2) the hæmin test, by which crystals are produced from the hæmoglobin and identified under the microscope; (3) the spectroscope test, which gives a spectrum of hæmoglobin; (4) the microscope test, by which the blood-corpuscles are identified. To answer the second question requires either (1) the microscopical examination that determines the size, shape, and qualities of the blood-corpuscles; or (2) a much more reliable serum test, by which human serum, if brought in contact with the blood of an alien animal, causes dissolution of the blood-corpuscles of that animal's blood. By this serum test it is possible to detect any blood of any animal. B.-S. on wallpaper and elsewhere can often be found by candle-light, though not seen by daylight.—Expert scientific testimony as to the nature of stains has had great weight in many criminal trials. (See Taylor's *Medical Jurisprudence*, ed. by Reese, Phila. 1880.)

BLOODSTONE: see HELIOTROPE.

BLOOM, n. *blôm* [Icel. *blomi;* Dut. *bloeme;* Ger. *blume*, a flower (see BLOW)]: blossom; the flower of any plant; the bright color of the cheeks; the beginning of youth or manhood; life; vigor; beauty; bright or blue color on fruit, as on the peach or grape; a clouded appearance which varnish sometimes assumes upon the surface of a picture; a whitish waxy secretion produced on the surface of some leaves and fruits: V. to put forth blossoms; to flower; to be in a state of vigor; to have the freshness and beauty of early life. BLOOM'ING, imp.: ADJ. putting forth blossoms; healthful; fresh-colored. BLOOMED, pp. *blômd*. BLOOM'INGLY, ad. *-li*. BLOOM'INGNESS, n. BLOOM'Y, a. *-i*, full of bloom.

BLOOM, n. *blôm* [AS. *bloma*, a mass, a lump]: the rough mass of iron from the puddling-furnace after undergoing the first hammering. BLOOM'ARY or -ERY, n. *-ėr-i*, the furnace in which cast is converted into malleable iron.

BLOOM'ING, n. the process of converting cast into malleable iron.

BLOOM: an appearance on paintings resembling in some measure the bloom on certain kinds of fruit, such as peaches, plums, etc. (hence the name), produced, in all probability, by the presence of moisture in the varnish, or on the surface of the painting when the varnish is laid on. The B. destroys the transparency, and is consequently very injurious to the general effect of a picture. It is best prevented by carefully drying the picture and heating the varnish before applying it; and best removed by a sponge dipped in hot camphine, after which a soft brush should be employed to smooth the surface of the picture which should be finally placed in the sunshine to dry.

BLOOMARY: see BLOMARY.

BLOOM'ERISM: a fashion of women's dress, partly resembling male attire, which arose out of the 'Woman's Rights Movement,' that began in the United States about 1848. The claim was that women should take their place in the world as fellow-workers with men, and ought not to be under the disadvantage of having a dress that hampered their movements, requiring much muscular power for its support. In 1849, Amelia (Jenks) Bloomer, of Seneca Falls, N. Y. (b. 1818), adopted the costume, and lectured in various places on its advantages. The bloomer dress consisted of a jacket with close sleeves, a skirt falling a little below the knee, and a pair of Turkish trousers. Though a few women followed the example of Mrs. Bloomer, the dress was extremely unpopular, and exposed its adherents to a degree of social martyrdom which most women declined to brave. A very elegant modification of the Bloomer dress was achieved by a New York lady—a Polish jacket, trimmed with fur, and a skirt reaching to within a few inches of the ground, and showing off merely the trim furred boot, but still sufficiently short to avoid contact with the dirt of the street. In England, B. failed to gain entrance into respectable society, and speedily disappeared. Still, the desire for dress-reform has not died out on either side of the Atlantic; but the prejudice with which any innovation is sure to be met greatly discourages every attempt to introduce a reform.

BLOOMFIELD, *blôm'fēld,* town in Essex co., N. J.; a northwestern suburb of Newark, connected by electric lines, and with stations on the Erie and Lackawana railroads, 11 m. w. of New York city. Founded in 1685 as Watsesson, it was renamed after Gen. Joseph Bloomfield, in 1796. Besides being a residential town, it has manufactures of woolen, felt, leather, rubber, hardware, brass, and photographic goods, electric elevators, and organs. The German (Presbyterian) Theological Seminary of Newark, the Westminster and First Presbyterian (built 1796) churches, the Jarvie library, and national bank are are the chief buildings. Pop. (1910) 15,070.

BLOOMFIELD, Joseph, American soldier: b. Woodbridge, N. J.; d. Burlington, N. Y., 1823, Oct. 3. When the Revolutionary War broke out he was studying law, but joined the cause of the colonists with enthusiasm. In 1776 he received a captain's commission in the 3d New Jersey regiment, served with distinction throughout the war, and was mustered out a major. Resuming his legal studies, he acquired a successful practice in Burlington, was elected attorney-general, and twice (1801, 1812) governor of the State. During the War of 1812 he commanded a brigade. From 1817 to 1821 he was a representative in Congress, and as chairman of the Committee on Revolutionary Pensions he reported the bill granting pensions to soldiers of the Revolutionary army. In 1793 he was appointed a trustee of Princeton, and during his eight years' membership of the board, did much to promote the interests of that college.

BLOOMFIELD, Maurice, American educator: b. Bielitz, Austria, 1855, Feb. 23. He came to the United States in 1857; entered the University of Chicago, and was graduated at Furman University, in Greenville, S. C., in 1877; took a course in Sanskrit and comparative philology in Yale College 1877–8; and was a Fellow of Johns Hopkins University 1878–9. He continued his studies in Berlin and Leipsic 1879–81; became an associate in Johns Hopkins University in 1881; and subsequently professor of Sanskrit and comparative philology there. He published numerous grammatical and philological papers; edited for the first time from the original Sanskrit MSS. the *Sutra of Kauçika;* translated the *Atharva-Veda* in the *Sacred Books of the East;* and has since been engaged in compiling a *Concordance of the Vedas.* He has also written *The Atharva-Veda and the Gopatha-Brahmana* (1899); *Cerberus, the Dog of Hades* (1905); etc.

BLOOMFIELD, Robert: 1766–1823: b. Honington, near Bury St. Edmund's: son of a poor tailor, who died, leaving Robert an infant. His mother with difficulty subsisted by teaching a school, where B. learned to read. At the age of 11 he was hired to a farmer, but ultimately became a shoemaker in London, where, in a poor garret, he wrote his *Farmer's Boy,* published 1800. It had extraordinary popularity, and was translated into a number of languages. He subsequently published *Rural Tales, Wild Flowers,* and other pieces. Though efforts were made for him by persons of rank, his health broke down, and he died nearly insane, at Shefford, Bedfordshire.

BLOOMFIELD, Samuel Thomas, D.D.: 1790–1869: clergyman of the Church of England: graduate of Cambridge; rector at Bisbrooke, Rutland; translator of Thucydides' *Peloponnesian War;* author of many annotations to the New Testament, and of English notes to the New Testament in Greek—the latter much used in England and America.

BLOOMINGTON: city of central Ill., seat of McLean

co., 59 m. n.e. of Springfield, 126 m. s.w. of Chicago, on the Cleveland, Cincinnati, Chicago and St. Louis, the Chicago and Alton, the Illinois Central, and the Lake Erie and Western R. Rs. B. was settled in 1831 and received a city charter in 1850. The Chicago and Alton R. R. construction and repair shops are situated here and employ nearly 1,000 men; there are also shoe factories, foundries, furnaces, brick-yards, flour mills, pork-packing and fruit-canning establishments, and an active industry is the coal mines of the neighborhood. The educational institutions include the Ill. Wesleyan Univ., coeducational, with a faculty of 34 members, and an enrollment of 300 students; the Ill. Normal Univ. in the northern suburb Normal, and a public library. The city hall and court-house are fine buildings. Electric lighting, street railways, artesian water-works and parks supply public needs. Pop. (1910) 25,768.

BLOOMINGTON: city, seat of Monroe co., Ind., 60 m. s.w. of Cincinnati, on the Chicago, Indianapolis and Louisville R. R.; between branches of the White river. It is in a limestone region with large quarrying and agricultural interests, and manufactures of hardware, leather, furniture, etc. It is also an important educational center, Ind. Univ. being situated here, with a faculty of 77 members and an average attendance of over 1,100 students. Pop. (1890) 4,018; (1900) 6,460; (1910) 8,838.

BLOOMSBURG, *blômz′bẽrg* town, seat of Columbia co., Penn., 40 m. s.w. of Wilkesbarre, on the Susquehanna river, the Penn. canal, the Bloomsburg and Sullivan, the Lackawanna, and the Philadelphia and Reading R. Rs. It is in a limestone and iron-mining region, and has important metal works and other industrial establishments, including silk, carpet, and furniture factories. County and town institutions, a state normal school, and literary institute, are among the chief buildings. Pop. (1890) 4,635; (1900) 6,170; (1910) 7,413.

BLOSSOM, n. *blŏs′sŭm* [AS. *blostma*, and *blosma;* Dan. *blusse*, to blaze: Dut. *blosem*, a blossom: L. *flos* or *florem*, a flower]: the flower of any plant, especially when it precedes fruit: V. to put forth flowers before the fruit begins to grow. Blos′soming, imp.: N. the flowering of plants. Blos′somed, pp. *-sŭmd.* Blos′somy, a. *-sŭm-ĭ*, full of blossoms. Blos′somless, a.

BLOT, v. *blŏt* [Dan. *plet*, a stain; *blat*, a portion of any thing wet: Icel. *blettr*, a spot, a stain: Fris, *blat*, bare: Scot. *blad*, a lump of anything soft]: to wet or discolor a part; to spot or stain with ink or any other coloring matter; to destroy; to efface; to defame: N. a spot or stain; a blemish. Blot′ting, imp. Blot′ted, pp. Blot′ter, n. one who or that which. Blotting-paper, a soft unsized paper used for drying freshly-written paper by imbibing a portion of the ink. Blotty, a. *blŏt′tĭ*, full of blots. —Syn. of 'blot, v.': to expunge; rase; erase; efface; cancel; obliterate; disgrace; tarnish;—of 'blot, n.': stain; blemish; flaw; defect; speck; fault; blur.

BLOT, n. *blŏt* [Sw. *blott;* Dan. *blot;* Dut. *bloot,* naked, exposed]: at *backgammon,* a piece so left as to make it liable to be taken.

BLOTCH, n. *blŏch* [Ger. *plotz,* a blow or the sound of it; *blätz,* a spot or blot: Ger. *platschen,* to splash; *platsch,* a splash: connected with BLOT 1, which see]: a scab or eruption on the skin: V. to blacken or spot. BLOTCH'ING, imp. BLOTCHED, pp. *blŏcht:* ADJ. irregularly disposed in broad patches. BLOTCH'Y, a. *-ĭ,* full of blotches.

BLOTE, v. *blōt* [Sw. *blota,* to soak, to steep (see BLOAT)]: to dry by smoke, as fish. BLO'TER: see BLOATER.

BLOUET, *blô-ā,* PAUL (MAX O'RELL): French lecturer and author; b. Brittany, France, 1848, March 2; d. Paris, 1903, May 24. In early life he was an officer in the French army, but in 1873 went to England and became a teacher. After the publication of his first book, *John Bull and His Island* (1883), he abandoned teaching and devoted himself to literature. His works include *John Bull and His Daughters* (1884); *Jonathan and His Continent* (1888, with Jack Allyn); *A Frenchman in America* (1891); *John Bull & Co.* (1894).

BLOUNDELLE-BURTON, *blŭn'dĕl bėr'tŏn,* JOHN EDWARD, English novelist: b. 1850, March 3. He was educated for the army, has lived and traveled in the United States and many European countries and has been a correspondent of various English and French journals. His published works include: *The Silent Shore* (1886); *His Own Enemy* (1887); *Across the Salt Seas* (1898); *The Scourge of God* (1898); *Fortune's My Foe* (1899); *A Bitter Heritage* (1899); *The Seafarers, Servants of Sin* (1900); *A Vanished Rival* (1901); *The Year One* (1901); *The Fate of Valsee* (1902); *A Branded Name* (1903); *The Intriguer's Way* (1903); *A Dead Reckoning* (1904); *The Land of Bondage* (1904); *The Sword of Gideon* (1905); etc.

BLOUNT, *blŭnt,* JAMES HENRY: 1837, Sept. 12—1903, Mar. 8; b. Macon, Ga. He was elected to congress from Ga. as a democrat 1872, and re-elected until 1892, when he declined renomination. He was appointed by Pres. Cleveland 1893, Mar. 13, his special 'paramount' commissioner to the Hawaiian Islands, with reference to the revolution there which had placed Hawaii under the protection of the U. S. flag, with a view to annexation. Soon after his arrival, B. ended the protectorate and ordered the Amer. flag hauled down. This commission evoked sharp criticism. In May, B. was appointed U. S. minister to Hawaii, and soon afterward resigned.

BLOUSE, *blowz* [F. *blouse;* mid. L. *blialdus;* Pers. *balyád,* a plain garment]: loose sack-like over-garment. The coat worn by officers and soldiers of the U. S. army and militia, except on occasions of ceremony, is so called. The B. worn by English wagoners, etc., is called a smock frock.

BLOW, n. *blō* [Dut. *blacuwen,* to strike; *blaeuw,* blue,

livid: OF. *blau*, a bruise, a blow: Gr. *plegē;* L. *plaga*, a blow, a stroke—*lit.*, a livid mark left by a stroke]: a stroke, first act of hostility; a sudden calamity. COME TO BLOWS, to quarrel; to engage in battle. A BLOW-OUT, in *slang*, a holiday; a good and plentiful meal; a drunken frolic. AT A BLOW, at one effort; suddenly; at a single act, as, he lost all at a blow.

BLOW, v. *blō* [AS. *blawan*, to blow or breath: Ger. *blähen*, to puff up: Gael, *blagh*, to blow, as the wind]: to puff up or inflate; to move as air; to pant or puff; to throw or drive a current of air into or upon; to warm or cool by the breath; to sound a wind instrument; to deposit eggs, as flies. BLOW'ING, imp. BLEW, pt. *blô*. BLOWN, pp. *blōn:* ADJ. swollen; puffed up; quite out of breath. BLOW'ER, n. one who. BLOWY, a. *blō'ĭ*, windy. BLOW-PIPE, n. *-pīp*, a tube through which a current of air is driven on a flame to obtain an increased heat. BLOW-OFF-PIPE, in a *steam-engine*, the pipe fixed to the bottom of a boiler for discharging the sediment. BLOW'ERS, n. plu. *-ėrz*, in *coal-mining*, the puffs or jets of carburetted hydrogen given off by fissures in the coal. BLOW-BALL, the downy head of the dandelion. BLOW-FLY, the carrion-fly, which deposits its eggs on flesh-meat. TO BLOW OFF, to permit to escape, as, steam. TO BLOW OVER, to pass away. TO BLOW UP, to drive up into the air, as by gunpowder; to raise or swell with the breath; to give a scolding to. TO BLOW OUT, to extinguish by the wind or by the breath. BLOWING-HOUSE, the blast-furnace in which tin ore is fused. BLOWN UPON, made stale or disreputable; tainted; discredited; discovered; exposed. TO BLOW HOT AND COLD, to appear as both favoring and opposing; to be inconsistent.

BLOW, v. *blō* [AS. *blowian*, to bloom: Ger. *blühen*, to bloom or blossom: Gael. *blàth*, bloom, flowers—*lit.*, to shine with bright colors]: to come into flower; to show flower. BLOW'ING, imp. BLOWN, pp. *blōn*.

BLOW'-FLY (*Sarcophaga carnaria*): insect of the order *Diptera* (two-winged), (q.v.) and of the large family *Muscides* of which the common House-fly (q.v.), Flesh-fly (q.v.), etc., are familiar examples. The B. is very similar to these in its general appearance; its body is hairy, the expanse of its wings about one inch, the face silky and yellow, the thorax gray, with three black stripes, the abdomen of a shining blackish brown, which, in certain points of view, assumes a bluish tint, checkered with glittering yellowish spots. One of the distinguishing characters of the genus is, that the eyes are widely separate in both sexes. The species of this genus are frequently ovoviviparous, the eggs being hatched within the body of the parent. The B. has a wide range through many countries, particularly in some marshy districts; and its larvæ are to be found feeding upon meat, the carcasses of animals, sometimes upon living earthworms, and frequently upon sheep, of which it is one of the most grievous pests, requiring the constant attention of the shepherd during

most of the summer and autumn. Unless the maggots are removed, they eat into the skin, the sheep suffer great torment, and soon die. At first they may be removed by shaking them out of the wool, into which dry sand is then abundantly sprinkled; but if they are very numerous, a mercurial ointment or wash of corrosive sublimate is applied; and when the skin is much broken, the wool is clipped away, an ointment of tar and grease is used, and a cloth sewed over the part. Like many other insects, the B. multiplies with excessive rapidity.

Another species of this genus is *S. mortuorum*, so named from its frequenting burial-vaults and similar places. It is very similar to the B., but the abdomen is of a shining steel-blue, and there is a reddish-brown line down the forehead.

BLOW'ING-MACHINES: apparatus for making and directing a blast of air. The earliest blowing-machine was, doubtless, some form of the common bellows, the idea of which is supposed to have been derived from the lungs. A very primitive form of this instrument is still in use in some eastern countries, consisting simply of the skin of some animal sewed into a rude bag with a valve and nozzle. The older forms of domestic bellows all are on the same principle—viz., a chamber formed of two boards with flexible leather sides, having at one end a nozzle with a narrow mouth; and in the lower board, a

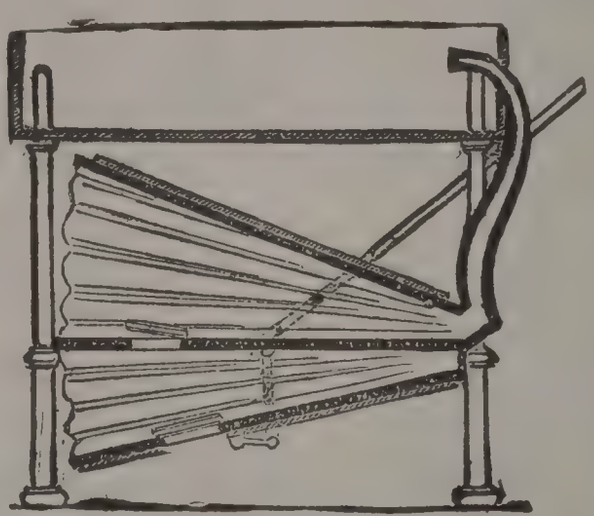


Fig. 1.—Section of Double-bellows for a Portable Forge.

valve of considerably larger area for the admission of air. When the bellows are distended by drawing the boards apart, air is sucked in by the valve, to replace the vacuum that tends to form; and then, when the boards are being closed, the valve, which only opens inward, is shut by the compressed air; and the latter, having no other escape, is forced out at the nozzle.

The great fault of the common bellows is, that it gives a succession of puffs, and not the continuous blast needed in certain operations. One remedy for this was to use two bellows, so that one was blowing while the other was filling; but it was afterward found that the double-bellows

secured a more uniform blast. This machine, shown in fig. 1, is merely the common bellows with a third board of the same shape as the other two placed between them, so as to form two chambers instead of one. The middle board is fixed, and both it and the lower one have valves placed in them opening inward. A weight on the lower board keeps the under chamber filled with air; and when this board is raised by a lever or otherwise, the air which it contains is forced into the upper chamber. The exit-pipe is attached to the latter, and a weight is placed on the upper board sufficiently heavy to press the air out in a continuous stream, the continuity being maintained by the large quantity of air always present in the upper chamber, and the uniform pressure of the weight. Sometimes a spring is used instead of a weight to press out the air. Even with the double-bellows, however, the constant re-filling of the upper portion from the lower prevents the blast from being quite regular.

For such purposes as the supplying of a continuous stream of air to a flame for glass-blowing or soldering, a very convenient apparatus has been constructed by P. Stevenson of Edinburgh, which the diagrams (figs. 2 and 3) will explain. By means of the common bellows worked

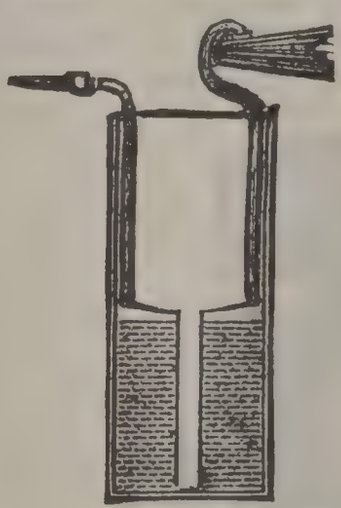


Fig. 2.

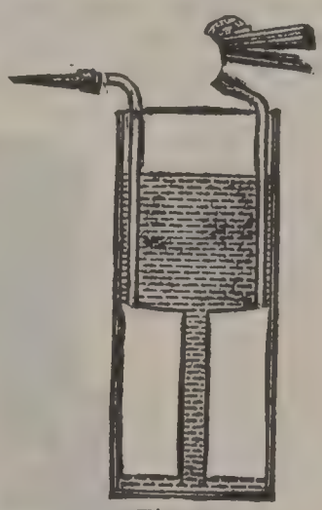


Fig. 3.

by a treadle, air is blown into the lower portion of a small cylinder containing a quantity of water, and having a diaphragm in the middle of the height, with a wide pipe reaching nearly to the bottom. When the apparatus is at rest, the water remains below the diaphragm, as shown in fig. 2; but when air is blown in, it gradually rises through the pipe to the position shown in fig. 3. The water as it descends then presses out the air in a steady stream by the exit-pipe, as a valve prevents it returning to the bellows.

Bellows made entirely of wood except the nozzle, first made in Germany in the 16th c., are in use in some countries of continental Europe. They are usually of large size, and the contrivance consists in having two boxes, of which the sides of the upper inclose those of the lower, so that the former can move up and down on the latter with-

out admitting air except by a valve, as in the common bellows, of which, in fact, they are only a modification.

The Chinese have a very simple form of bellows, shown in fig. 4, which is not only interesting in itself, but also because its action is almost the same as the blowing-engine. It is merely a square chamber of wood, with a close-fitting

Fig. 4.—Chinese Bellows.

piston, which, when drawn from the nozzle, opens the valves *v*, *v*, to admit air, and when pushed in the opposite direction, shuts these valves, and forces the air out by the nozzle.

For blowing a domestic fire in a chimney, the most effective contrivance is a metal screen to close the front of the aperture above the grate, so that the supply of air must all pass through the fire. This kind of blower, however, will act only when the fire is already producing as much heat as to cause a sensible draught up the chimney.

For smelting and refining furnaces, where a blast with a pressure of 3 or 4 lbs. per square inch is required, blowing engines of large size, run at low speed, were formerly employed: see IRON (fig. 1). A form often preferred consisted of a steam-engine, with the ordinary steam

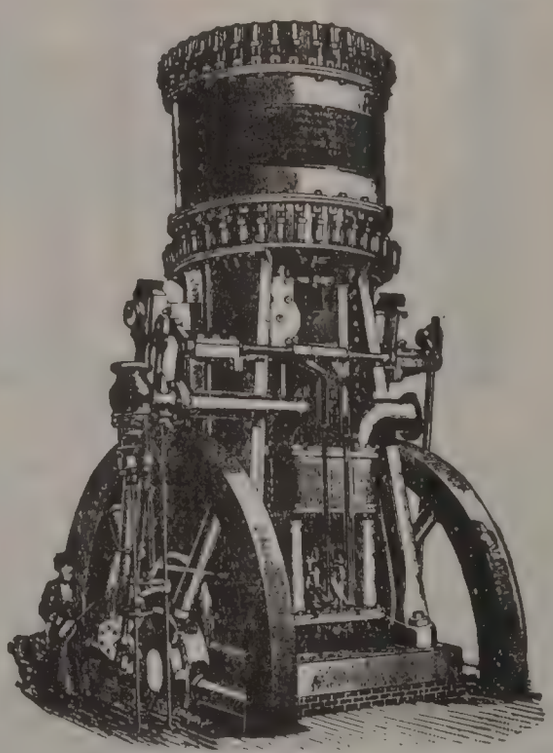


Fig. 5.—Positive Motion Blower for Anthracite Furnaces.

cylinder at one end, and a blast cylinder at the other end of the beam. Sometimes a horizontal arrangement was adopted for smaller engines. For the valves large flaps of leather were used, backed with metal or

wood. About 1876 the direct-acting vertical form with smaller valves and much higher speed—the blowing cylinder usually above the steam cylinder—began to come into use, and are now employed very commonly. A blowing-engine of this style, from the Weimer machine-works, Lebanon, Penn., is shown in fig. 5. The valves—of sheet rubber, perforated with slots, and resting on iron seats in which are alternating slots, and lifting against iron guards whose slots correspond to the valve-slots—work with equal ease on any plane; hence they may be so set as to provide the maximum area of opening. The blowing cylinder-heads accommodate the inlet valves, while the outlet valves are in the periphery of the cylinder. In this form of engine, the differing pressure on the air piston and on the steam piston during a stroke causes fluctuations of energy, which necessitate two large and massive fly-wheels for an alternate balancing of the fluctuations by receiving, retaining, and dispensing the energy, each in its turn.

Fig. 5 shows a blowing-engine of positive motion, steam-valve gear, for anthracite furnaces: steam cylinder diameter 42 in., blowing cylinder diameter 84 in., revolutions per minute 20-60, minimum air-discharge per minute 6,140 cu. ft., maximum air-discharge 18,420 cu. ft., air-pressure 3-14 lbs. per sq. in.; at working-speed (revolutions per minute 50), air-discharge 15,350 cubic feet.

Large blowing engines for blast furnaces are also made horizontal, much resembling air-compressors, except that for iron smelting they are larger and have less pressure capacity than an air-compressor as used for mining operations. Those of the largest size are compounded, that is have both high and low-pressure steam cylinders, as well as air-cylinders. The latter are sometimes of five feet stroke and eight feet diameter. See AIR-COMPRESSOR and BLAST FURNACE.

Rotary piston blowers force the air through, much as it is forced by the piston type of blowing engines that have been described. They are made on the same principle as rotary pumps, having a central chamber in which two blades turn in such a manner as to continually displace the air in one end of the chamber, and carry it to the other end. See Root's Blowing Machine, fig. 6. There are horizontal shafts running through the chamber at the central level, each bearing a blade that somewhat resembles a figure 8 in section. These shafts are connected outside of the chamber by gearing, indicated by the dotted lines, and they rotate in the direction of the arrows. The 8-shaped blades fit into each other as they turn, and also fit close to the casing. In the drawing, the air in the space on the right is about to be carried upward and out at the top by the right-hand blade, and the air in the top space is being crowded or driven upward by the turning of the blade at the left.

Fans or disk blowers operate on the principle familiar in the electric fan. The simplest forms are made of

blades twisted like those of a screw propeller and mounted on an axle, driving the air by rapid rotation. Such a fan placed in a short tube in the wall of a building may be used to draw in or blow out the air, thus securing ventilation.

In pneumatic systems, as for transporting mail matter in tubes, a positive blower is required, and air-compressors are employed. A disk type of blower has also been used with success. The trompe, used in old Spanish and

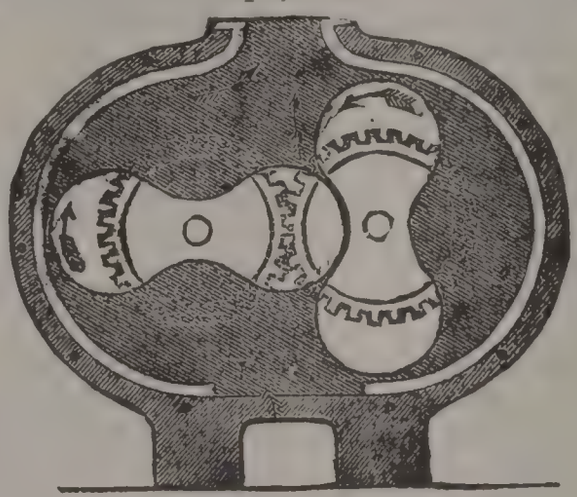


Fig. 6.—Roots' Blowing-machine.

Continental forges, which operates on the principle of an aspirator, is the forerunner of modern jet-blowers. In all these water is forced through a small pipe which is enclosed within a large pipe. The escape of the water in a jet at the open end creates a draft that blows air out of the corresponding end of the large pipe. See VENTILATOR.

BLOW-PIPE: small instrument used in the arts for soldering metals, and in analytical chemistry and mineralogy, for determining the nature of substances by the action of an intense and continuous heat, its principle depending on the fact that when a jet of air or oxygen is thrown into a flame, the rapidity of combustion is increased, while the effects are concentrated by diminishing the extent or space originally occupied by the flame.

The B. generally consists of a conical tube of metal, about eight inches long closed at the wider or lower end, but open at the narrow or upper end which latter constitutes the mouth-piece, and is turned over to admit of the lips closing perfectly round it. Near the lower end, a small tube, fitted with a finely perforated nozzle is inserted at right angles to the large tube—the space below being intended as a chamber for condensing the moisture of the breath; through this nozzle, a fine current of air can be projected against the flame experienced with.

When a current of air from the B. is directed against a candle or gas-jet, the flame almost entirely loses its luminosity, owing to the perfect combustion of the gasses evolved from the source of heat, and is projected in a lateral direction, as a long pointed cone, consisting of two distinct parts. The inner part is somewhat brighter, and is

richer in unoxidized gases. The outer layer, being more plentifully supplied with oxygen, consists almost entirely of completely oxidized gases. The outer portion of the blow-pipe flame is called the 'oxidizing flame,' since this part, when directed against the specimen under examination, heats it while it is in contact with the air, and causes it to oxidize, if it is capable of doing so at the temperature that is attainable by the blow-pipe. The inner portion of the flame is called the 'reducing flame,' from the fact that when the specimen is exposed to this part, it is heated, not in contact with the air, but while surrounded with an atmosphere of partially unoxidized hydrocarbon gases. If a flame still richer in free carbon and unconsumed hydrocarbons is desired, the tip of the blow-pipe is held just outside of the lamp-flame, and a jet of flame with a luminous tip containing

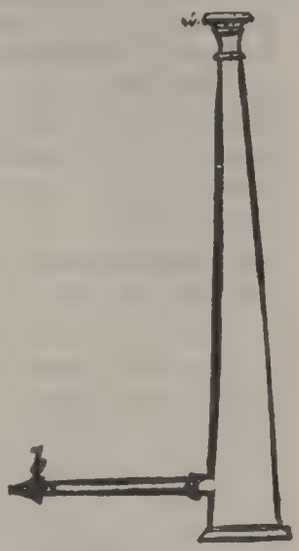


Fig. 1.

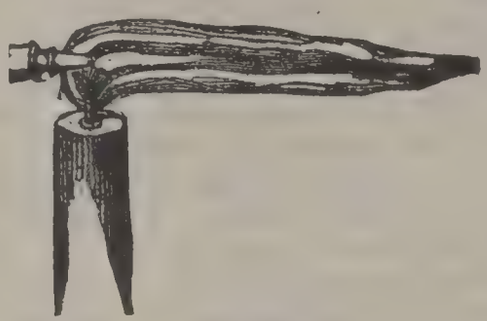


Fig. 2.

particles of solid carbon can easily be thrown down upon the specimen.

In blow-pipe analysis there is no recognized 'scheme' to be followed out. The method is oftenest used for the determination of minerals, and in such cases the analyst usually has some sort of idea, in advance, of the elements that may possibly be present. The substance to be examined is usually first pulverized, and a portion of it heated in a tube that is open only at the upper end. If it carbonizes, it contains organic matter of some kind, and the odor that is produced is often a good indication as to whether the organic matter is of an animal or vegetable nature. If the substance, when heated in the closed tubes, gives off water which condenses in the upper part of the tube, the moisture so condensed should be tested with litmus paper. If it is neutral, the substance is a hydrated compound, or a hydroxide. An acid reaction indicates acid salts, and an alkaline one may usually be taken to indicate the presence of compounds of ammonia. If the substance melts but does not change its color, it is an alkaline or a hydrated salt. If it melts and turns yellow, remaining yellow even after cooling, it contains oxide

of bismuth; while if it melts to a yellow color, but turns red upon cooling, it contains oxide of lead. If it does not melt, but changes color, the indications are as follows: Yellow, both hot and cold, indicates stannic oxide; if yellow while hot, but white when cold, zinc oxide; if black while hot, and reddish-brown when cold, ferric oxide; if black while hot, but bright red when cold, mercuric oxide. If gas is evolved, its nature should then be determined. With microcosmic salt, the results obtained are generally similar to those with borax. Many metallic oxides are soluble in melted borax, and valuable color indications are obtained by heating small quantities of the substance in little beads of melted borax, that are held in the flame upon tiny loops of platinum wire. The phenomena that are observed in this way are quite complicated, however, and for an account of them the manuals on blow-pipe analysis should be consulted. The B. has been long used by goldsmiths and jewellers for soldering metals, and by glass-blowers in fusing and sealing glass tubes, etc.; it has also been applied in qualitative analysis for many years, but more recently chemists have given great attention to its use, and have even employed it with much success in *quantitative* chemical analysis.

BLOW'-PIPE AND AR'ROW: a kind of weapon much used by some of the Indian tribes of S. America, both in war and for killing game. It consists of a long straight tube, in which a small poisoned arrow is placed, and forcibly expelled by the breath. The tube or blow-pipe, called *gravatána*, *pocuna*, etc., is 8–12 ft. long, the bore not generally large enough to admit the little-finger. It is made of reed or of the stem of a small palm. Near Pará, it is in general very ingeniously and nicely made of two stems of a palm (*Iriartea setigera*, see IRIARTEA) of different diameters, the one fitted into the other, in order the better to secure its perfect straightness. A *sight* is affixed to it near the end. The arrows used in that district are 15–18 inches long, made of the spines of another palm, sharply pointed, notched so as to break off in the wound, and their points covered with *curari* (q.v.) poison. A little soft down of the silk-cotton tree (q.v.) is twisted round each arrow, so as exactly to fit the tube. In Peru, arrows of only 1½–2 inches long are used, and a different kind of poison seems to be employed. An accidental wound from one of these poisoned arrows frequently proves fatal. In the hand of a practiced Indian, the B. and A. is a very deadly weapon, and particularly when directed against birds sitting in the tops of high trees. As his weapon makes no noise, the hunter often empties his quiver before he gathers up the game, and does more execution than an English sportsman could with his double-barrelled fowling-piece.

BLOWZE, n. *blowz* [AS. *blysan*, to blaze; *blyse*, a torch: Dut. *blose*, the redness of the cheeks; *blozen*, to blush]: in *OE.*, a girl whose face looks red by active exercise in the

open air; a ruddy fat-faced woman. BLOWZY, a. *blow'zĭ*, fat and ruddy; glowing with redness, as the face; disordered in the hair and head-dress.

BLUBBER, n. *blŭb'bėr* [an imitative word, expressing the noise made by a mixture of air and water spluttering, as *the water blubbers up*, in the sense of froth: Gael. *plubraich*, a puddling in water: Low Ger. *blubbern*, to sputter]: a fatty, swollen substance; the coating of fat of a whale or seal; the sea-nettle, jelly fish, or medusa: V. to shed tears and slaver as a child; to weep in a noisy manner. BLUB'BERING, imp.: ADJ. slavering and childish weeping. BLUB'BERED, pp. *-bėrd:* ADJ. swollen with weeping. BLUB'BERER, n. one who.

BLUBBER: see CETACEA: WHALE: WHALE-FISHERY.

BLÜCHER, *blü'ċhėr*, GEBHARD LEBERECHT VON, Prince of Wahlstadt, Field-marshal of Prussia: 1742, Dec. 16—1819, Sep. 12; b. Rostock, in Mecklenburg-Schwerin, west Germany. At the commencement of the Seven Years' War, he joined a regiment of Swedish hussars, and in his first action was taken prisoner by the Prussian hussars, whose colonel persuaded him to exchange out of the service of Sweden into that of Prussia, and gave him a lieutenancy. A lieut., Jägersfeld, having been promoted over B.'s head, he immediately wrote to Frederick the Great as follows: 'Von Jägersfeld, who has no merit except that of being son of the Markgraf of Schwedt, has been put over my head: I beg to request my discharge.' The result was, that B. was put under arrest, and after repeated applications for discharge, he received from Frederick the curt intimation: 'Captain Blücher is at liberty to go to the devil!' B. went instead to his estate of Grossraddow, in Pomerania, and applied himself to farming; but he soon tired of a bucolic life. In 1793, having returned to the army, he fought, as colonel of hussars, against the French on the Rhine, evincing great genius as a leader of cavalry. The breaking out of the war of 1806 led him, as lieut.-gen., to the battle of Auerstadt. B., with the greater part of the cavalry, occupied the left flank of the Prince of Hohenlohe in the retreat to Pomerania. He is accused, on this occasion, of not giving the prince due support, and thus leading to the capitulation at Prenzlau. B. himself then marched into the territory of the free-town of Lübeck, and hastily fortified the city; but the French took it by storm, and B. was forced to surrender at Ratkow, near Lübeck, whither he had escaped with a few troops. A fortnight after, he was exchanged for the French general Victor; and immediately on his arrival in Königsberg, was sent, at the head of a corps, by sea, to Swedish Pomerania, to assist in the defense of Stralsund. After the peace of Tilsit, he was employed in the war-dept. in Königsberg and Berlin, and subsequently became commander in Pomerania. At a later period, he was pensioned, with several other men of note, at the instance, it was said, of Napoleon. He was one of the few to combat the general

belief in the invincibility of Napoleon, which had grown into a sort of fatalism in high places. In common with Stein and Hardenberg, he labored to remove all weak and unpatriotic counselors from the person of the king. When all the leaders of the army lost courage his constancy revived confidence, and made him the centre of all hope for the future. When the Prussians at last rose in opposition to France, B. was appointed to the chief command of the Prussians and of Gen. Winzingerode's Russian corps. At the battles of Lützen, Bautzen, and Haynau, he displayed heroic courage. At the Katzbach, he defeated Marshal Macdonald, and cleared Silesia of the enemy. In vain did Napoleon himself attempt to stop the 'old captain of hussars,' as he called him, in his victorious career. In the battle of Leipsic he won great advantage over Marshal Marmont at Möckern, 1813, Oct. 16, and on the same day pressed on to the suburbs of Leipsic. On the 18th, in conjunction with the crown-prince of Sweden, he had a great share in the defeat of the French, and on the 19th his troops were the first to enter Leipsic. B., in opposition to the policy of Austria, continually pressed the taking of Paris as the real aim of the war. In 1814, Jan. 1, he crossed the Rhine, garrisoned Nancy on the 17th, and after winning the battle of La Rothière, pressed forward to Paris; but his scattered corps were routed by Napoleon, and he fought his way back to Chalons with great loss. On Mar. 9, however, he defeated Napoleon at Laon; and at the end of the month, after being joined by Schwarzenberg and his corps, he again advanced toward Paris. The day at Montmartre crowned the brilliant deeds of this campaign and, Mar. 31, B. entered the French capital. Frederick William III. created him Prince of Wahlstadt, in remembrance of the victory at the Katzbach, and gave him an estate in Silesia. In England, whither he followed the allied sovereigns, he was received with an enthusiasm never before excited by a German. The Univ. of Oxford conferred on him the degree of Doctor of Laws. After Napoleon's return, 1815, B. once more assumed the general command, and promptly led the army into the Netherlands. In 1815, June 16, he lost the battle of Ligny, in which he was personally in great danger, from his horse falling on him. The victory of the allies at the battle of Waterloo was completed by B.'s timely appearance on the field. B. ordered his Prussians to pursue the flying enemy, which they did the whole night. Declining the offered truce, B. marched again against Paris, and on the second taking of that city manifested a strong desire to retaliate on Paris the spoliation that other capitals had suffered at the hands of the French; but he was held in check by the Duke of Wellington. In order to reward B.'s services to Prussia and the common cause, Frederick William III. created a new order, the badge of which consisted of an iron cross surrounded by golden rays. In 1819, Aug. 26, a colossal bronze statue was

erected in his honor in his native town. B. died, after a short illness, at his estate of Krieblowitz, in Silesia. In Berlin, a statue 12 ft. high, modelled by Rauch, and cast in bronze by Lequine and Reisinger, was erected to his memory, 1826, June 18, and at Breslau another, also executed by Rauch, in 1827. In the beginning of the campaign of 1813 his characteristic activity and the style of his attacks gained him the nickname of 'Marshal Forward' from the Russians; it soon became his title of honor throughout Germany. His tactics were always much the same: to attack the enemy impetuously, then to retreat when the resistance offered was too great for his troops to overcome; to form again at a little distance, and watch narrowly the movements of the enemy, and whenever an advantage offered itself, to charge with lightning speed, and throw him into disorder, make a few hundred prisoners, and retire ere the opposing force had recovered from its surprise. Such were his usual maneuvers. B., as a man and as a soldier, was rough and uncultivated, but energetic, open, and decided in character. His ardent enthusiasm for the liberation of Prussia and Germany from a foreign yoke, and his uncompromising pursuit of his noble aim, have justly rendered him a hero in the eyes of the German people. The old red uniform, and the old name of 'Blücher's Hussars,' were restored to the 5th Regt. of Hussars by Frederick William IV., on occasion of the centenary celebration of B.'s birthday.

BLUDGEON, n. *blŭj'ŭn* [Goth. *blyggwan*, to strike, to kill: Irish,*eblocan*, a little block: compare Gael. *blough*, strength]: a short heavy stick, used for offense and defense.

BLUE, n. *blô* [AS. *bleo;* O. H. G. *blaw*, blue: Icel. *blár*, livid: F. *bleu*, blue—from mid. L. *blāvus*, a sky-color, blue: Gael. *glas*, pale, wan]: the color of the clear sky; one of the primary colors; azure: Adj. resembling blue; dejected: V. to make blue. Blu'ing, imp. Blued, pp. *blôd*. Blueness, n. the quality of being blue; livid look; indecent writing or conduct. Blu'ish, a. tinged with blue. Blu'ishly, ad. *-lĭ*. Blu'ishness, n. Blue-gowns, a class of privileged mendicants in Scotland who received on the sovereign's birthday blue cloth for a coat and gown, a badge of privilege, a small sum of money, and a slight refreshment. Blue-jacket, n. *blô'jăk-ĕt*, a sailor, so named from the color of his coat or jacket. Blue-fish, n. a species of *Coryphæna*, found in the Atlantic; the *Pomatomus saltatrix*, a fish like a mackerel but larger, found on the Atlantic coast of the United States. It is called also Horse-mackerel and Salt-water Tailor. Blue Monday, the Monday preceding Lent, when, in the 16th c., the churches were internally decorated with blue. Blue-ointment, mercurial ointment. Blue-pill, a pill containing mercury. Blue-stockings [a literary club of the 18th century, chiefly of ladies, so called from the leading member, a gentleman, always appearing in *blue stockings*]: a term applied to ladies devoted to literature.

BLUE-STONE, also called BLUE-VITRIOL, sulphate of copper used as a caustic. BLUE-SHONE, an Australian miner's term for the basaltic lava through which they have sometimes to dig in search of gold. BLUE-JOHN, a miner's term for fluor or Derbyshire spar. BLUE-BONNET, in *Scot.*, a cap woven of thick blue worsted yarn—so named from their bell-shape and blue color. BLUE-BELL, a name applied to two British plants—1, the common wild hyacinth flowering in spring, the *Hyăcinthus nonscriptus*, ord. *Liliăcĕæ;* 2, the Scotch blue-bell, flowering in summer, the *Campăn'ula rotun'dĭfōlĭă*, ord. *Campănulăcĕæ*. BLUE-BOTTLE, a large fly with a blue abdomen; a wild plant having a blue flower, the *Centaurĕă cyănŭs*, ord. *Composĭtæ;* in England a familiar name for a policeman, from the color of his dress. BLUE-BOOK, a book containing a Brit. gov't. official return or report, so called from its *blue cover*. BLUE-BREAST, a bird. BLUE-CAP, a small bird; a fish.

BLUE: one of the primary colors, azure, of which there are several varieties used in the arts, noted below: see also COLOR.

AZURE BLUE is a pigment prepared by mixing 2 parts of deep blue, 1 of oxide of zinc, and 4 of lead glass; the latter consisting of 4 parts of minium and 1 of sand. The above azure blue is for skies, but a pigment of more general use is prepared from 11 fused borax and 67 gray flux; the latter being itself made from 89 pebble flux, 75 minium, and 25 sand.—BERLIN BLUE: see PRUSSIAN BLUE.—BRUNSWICK BLUE, or *Celestial*, is made by precipitating the alumina from a solution of alum by carbonate of soda, washing the precipitate, and adding sulphate of baryta, sulphate of iron, yellow prussiate of potash, and some bichromate of potash. When dried, this mixture is known as Brunswick blue, but when the sulphate of baryta is left out, and the material not dried, it is called *Damp Blue*.—CERULEAN BLUE, is a color used in pottery, and consists of 79 parts of gray flux, 7 carbonate of cobalt, 14 hydrated carbonate.—BLUE COLOR OF FLOWERS, or *Anthocyanine*, may be obtained from those petals of flowers which are blue, by digesting them in spirits of wine in the dark. The color is soluble in alcohol, but is precipitated from its alcoholic solution by water. It is changed to red by acids, and to green by alkalies.—BLUE COPPERAS, or the Sulphate of Copper: see COPPER.—BLUE DYES: see INDIGO: LITMUS: PRUSSIAN BLUE: DYEING.—IRON EARTH BLUE occurs native among bog iron ore and in mossy districts in Europe and New Zealand. It consists mainly of a phosphate of iron with a little alumina, silica, and water. It is called *Native Prussian Blue*.—INDIGO BLUE, in pottery-ware, consists of 13 parts of carbonate of cobalt, 26 hydrated carbonate of zinc, and 61 gray flux.—COBALT BLUE is the only really good and serviceable blue in the coloring of glass and porcelain, and is essentially the oxide of cobalt (CoO), the coloring power of which is so great, that the addition of $\frac{1}{1000}$ part to white glass is sufficient to render it

blue. Several of the compounds named above owe their blue color to this substance: see COBALT.—DEEP BLUE is employed in porcelain coloring, and is made from 1 part of oxide of cobalt, 4 glass of lead (2 minium, 1 white sand), 1 lead glass (2 minium, 1 sand, 1 calcined borax), and 1 oxide of zinc, all of which are placed together in a porcelain crucible, fused for 2 or 3 hours; the residue washed, dried, and ground to a fine powder.—KING'S BLUE is made from 29 parts carbonate of cobalt, 29 sand, and 42 carbonate of potash, by fusing these ingredients in a crucible. The residue is intense deep blue, bordering on a black blue, and is generally reduced to powder, and re-fused with about half its weight of pebble flux (3 minium or litharge, and 1 sand).—MINERAL BLUE and PARIS BLUE: see PRUSSIAN BLUE.

PRUSSIAN BLUE is the deep blue color which is so frequently seen on cotton, muslin, and woolen handkerchiefs and dresses. It was discovered, 1710, by Diesbach, a color-maker in Berlin, and hence called *Berlin Blue*. The mode of its manufacture was published in Britain, by Dr. Woodward, 1724. It may be prepared in several ways: 1. By the addition of a solution of yellow prussiate of potash (ferrocyanide of potassium) to a solution of sulphate of iron (green vitriol). The blue compound thus produced deepens in tint when exposed to the air; and where it is required of greater consistence or more *body*, some alum and carbonate of potash are added to the prussiate solution before mixing with the iron solution. 2. By mixing solutions of yellow prussiate of potash and perchloride of iron, which yields the variety known as *Paris Blue*. 3. By adding a solution of the red prussiate of potash (ferrocyanide of potassium) to a solution of sulphate of iron, and this mode of preparation gives *Turnbull's Blue*. The Prussian blue settles to the bottom of the mixing vessels, and may be collected and dried by exposure to the air, when it is obtained as a blue powder. If heat be applied during the drying, the material cakes, and when cut exhibits a lustre and hue like copper. When alum has been used in its manufacture, the product has a dull earthy fracture. The composition of Prussian blue is that of a ferrocyanide of iron. See CYANOGEN. It is employed by washerwomen, under the name of *blue*, for neutralizing the yellow tint of cotton and linen clothes; by paper-makers, to color paper; and is very largely employed as a pigment in CALICO-PRINTING (q.v.) and DYEING (q.v.). *Mineral Blue* is formed when the Prussian blue is precipitated with a solution of zinc or magnesia, or moist carbonates of zinc or magnesia are added during the precipitation of the color. In the formation of *Royal Blue*, a solution of tin is added, and *Steam Blue* is produced on the addition of solutions of tartaric acid and yellow prussiate of potash. The impurities liable to be present in Prussian blue are starch, chalk, and stucco, either of which necessarily decreases the intensity of the blue color, and the utility of the substance.

SAXONY BLUE is prepared by dissolving indigo (q.v.) in Nordhausen sulphuric acid, and was first manufactured in Saxony, 1810, by taking the very finely powdered indigo

and incorporating it with the acid cautiously heated, when the indigo dissolves, and yields a blue color of great depth of tint. It is largely used in dyeing (q.v.).—OLD SEVRES BLUE is a cobalt blue used in pottery, and is made up of 19 parts oxide of cobalt, 39 dry carbonate of soda, 3 dry borax, and 39 sand.—THENARD'S BLUE is the blue formed by heating alum with a solution of cobalt, or it may be formed by igniting a mixture of phosphate or arseniate of cobalt with eight times its weight of alumina in the hydrated state procured by precipitation from alum by ammonia: used in pottery.—TURQUOISE BLUE is composed of 3 of oxide of cobalt, 4 of alumina, and 1 oxide of zinc. It is manufactured by dissolving the oxides of zinc and cobalt in dilute sulphuric acid, adding the liquid to a solution of 40 parts of ammonia alum, drying up and igniting at a red heat for several hours. The addition of a little chromate of mercury gives it a green shade.—VARIEGATED BLUE is used for coloring porcelain, and is formed by fusing 10 oxide of cobalt, 9 oxide of zinc, 5 lead glass (2 minium, 1 sand, and 1 calcined bones), and 25 glass of lead (2 minium and 1 sand).

BLUE STONE, or BLUE VITRIOL, is sulphate of copper: see COPPER.

BLUE'BEARD: hero in a well-known tale of fiction, which is of French origin. According to this romance, the Chevalier Raoul has a blue beard, from which he gets his designation. This personage tests his wife's curiosity by intrusting her, during his absence on a journey, with the key of a chamber which she is forbidden to enter. She is unable to stand the test, and he puts her to death. Several wives share the some fate, but at length the seventh is rescued at the last moment by her brothers, and B. is slain. The tale appears in innumerable collections under various forms. Tieck, in his *Phantasus*, has worked up this material into a clever drama, with numerous romantic and satirical additions, and Grétry has made use of it in his opera of *Raoul*.

The historic original of Chevalier Raoul appears to be one Giles de Laval, Lord of Raiz, who was made marshal of France, 1429, and fought valiantly in defense of his country when invaded by the English; but his cruelty and wickedness seem to have eclipsed his bravery, as he is remembered chiefly for his crimes, which credulous tradition has painted in the blackest and most fearful colors. He is said to have taken a pleasure, among other atrocities, in corrupting young persons of both sexes, and afterward in murdering them for the sake of their blood, which he used in his diabolical incantations. Out of this fact, in itself probably half-mythical, the main feature of the tale of B. has probably grown. Laval was burnt alive in a field near Nantes, 1440, on account of some state-crime against the Duke of Brittany.

BLUE'BELL: see HYACINTH.

BLUE'BIRD, or EASTERN BLUEBIRD, or WILSON'S B (*Sialia sialis*): bird of sub-family *Saxicolinæ*, family

Turdidæ; N. Amer. e. of the Rocky Mts. There are 2 other species—the WESTERN B. (*S. mexicana*), belly grayish-blue, instead of white; and the ROCKY MT. B. (*S. artica*), no chestnut color.—The EASTERN B. is a favorite with all classes of people in the United States as is the redbreast in Britain. Except in the southern states, it is chiefly known as a summer bird of passage, appearing early, however, as a harbinger of spring, and visiting again 'the box in the garden, or the hole in the old apple-tree, the cradle of some generations of ancestors.' It is common with farmers to provide a box for the B.'s nest. In size, the B. rather exceeds the redbreast, which, however it much resembles in general appearance. Its

Blue Bird (*Sialia sialis*).

food also is similar. The upper parts of the B. are of a rich sky-blue color, the throat and breast are reddish chestnut, and the belly white. The female is duller in colors than the male. The B. lays five or six pale-blue eggs, and has two or three broods in the season. Its song is 'a soft agreeable warble.' The male is remarkably attentive to his mate, and both exhibit extraordinary courage in driving away intruders from the vicinity of their nest. A hen, with her brood, has been seen to flee from the attacks of an enraged and pugnacious blue bird. The B. is known as an inhabitant of the Bermudas, Mexico, the West Indies, Guiana, and Brazil.—In the western and in the more northern parts of N. America, its place is taken by nearly allied and very similar species.

BLUE'-BOOKS: name popularly applied to the reports and other papers printed by parliament, because they are usually covered with blue paper. The term was, for like reasons, long applied to the reports sent annually by the governors of colonies to the colonial secretary; and even in technical official phraseology, these are called 'blue books.' The practice of printing, and to some extent pub-

lishing, the proceedings of the house of commons began in 1681. The chief contents of these papers at present are: votes and proceedings of the house; bills; estimates for the public services; accounts of annual expenditure; any documents which the ministry may submit voluntarily or on demand of the house; reports of committees of inquiry; and annual reports by the permanent commissions and govt. depts. The B. of a session now often fill 50 or 60 thick folio volumes.

There is no doubt that, though means are provided for finding what the B. contain, their contents are heterogeneous, and to a great extent cumbersome and valueless. They are not prepared on any uniform system, or subjected to general revision or editing. Each officer prepares his own report in his own way, sometimes lauding his own services, or arguing in favor of his own peculiar principles on some public question, so that it has been remarked that the B. contain a large number of articles like those in the periodical press, but too cumbersome and dull to get admission there.

Publications of the U. S. govt. or congress are not distinguished by any name founded on the color of their wrapping or covers. The official books of the govt. of France are yellow; Germany and Portugal, white; Italy, green; Spain, red; and it is customary to speak of them respectively as 'yellow books,' 'green books,' etc.

BLUE'-BOTTLE FLY: see FLESH-FLY.

BLUE CAR'DINAL: see LOBELIA.

BLUE'-EYE (*Entomyza cyanotis*): a beautiful little bird, abundant and very generally dispersed in New S. Wales, though not found in the more southern Australian colonies. It is a species of Honey-eater (q.v.) or Honey-sucker. It is a spirited bird, of elegant and graceful movements. The B. seeks its food almost exclusively among the blossoms and small leafy branches of *Eucalypti*. Numbers are often seen together clinging and hanging in every variety of position, frequently at the extreme ends of the small, thickly-flowered branches, bending them down with their weight.

BLUEFIELDS: river in the state of Zelaya, Nicaragua, which, after a course of several hundred miles to the e., enters the Caribbean Sea in lat. 12° n., and long. 83° w. Its lower stream is navigable to a distance of 80 m. from the sea. At its mouth is a good harbor, above which is the town of B., formerly the residence of the king of the Mosquito territory (q.v.).

BLUE'FISH (*Pomatomus saltatrix*): fish of the family *Pomatomidæ* of a genus having no detached finlets, no isolated dorsal spines, and no lateral armature of the tail, two dorsal fins, the first of which is small, and two deeply hidden spines in front of the anal fin. It is one of the most widely distributed and abundant of sea-fishes, being found in the Atlantic from the Mediterranean and Nova Scotia to Brazil, and in the Pacific and Indian oceans.

The upper parts are of a bluish color, the lower parts whitish; a large black spot at the base of the pectoral fins. The mouth is crowded with teeth, the jaws are furnished with large ones. The B. preys on other fishes, as the weak-fish, menhaden, and mackerel, the shoals of which it pursues. It is very swift, strong, and voracious. It sometimes attains a length of three feet and a weight of 14 pounds. It is much esteemed for the table, and great numbers are brought to market in Boston, New York, Philadelphia, and other towns about the end of summer. It is often caught by trolling, as it bites readily at any object drawn swiftly through the water. It frequently ascends rivers even to fresh water.

BLUE'-GOWNS: name commonly given to a class of privileged mendicants in Scotland. The proper designation of these paupers was the King's Bedesmen, or Beadsmen. In ancient times, a beadsman was a person employed to pray for another: see BEAD. From practices of this kind, there sprang up a custom in Scotland of appointing beadsmen with a small royal bounty, who ultimately degenerated into a class of authorized mendicants. Each of the beadsmen on his majesty's birthday received a gown or cloak of blue cloth, with a loaf of bread, a bottle of ale, and a leathern purse containing a penny for every year of the king's life. Every birthday, another beadsman was added to the number, as a penny was added to each man's purse. The most important part of the privilege was a large pewter badge, attached to the breast of the gown, which, besides the name of the bearer, had the inscription, *Pass and Repass.* This inferred the privilege of begging, and bespoke the kindly consideration of all to whom the beadsman appealed for an alms or a night's lodging. The fictitious character of Edie Ochiltree, in Sir Walter Scott's tale of the *Antiquary,* is a fair sample of this ancient and picturesque fraternity. The practice of appointing beadsmen was discontinued in 1833, at which time there were sixty on the roll. The whole have since died out. The last beadsman drew from the exchequer in Edinburgh his last allowance, 1863, May.

BLUE GRASS, or JUNE GRASS (*Poa pratensis*): a common species of grass, produced of the finest quality in central Kentucky, where a region called the 'Blue Grass Country,' is noted for the superiority of its cattle.

BLUEING OF METALS: see TEMPERING METALS.

BLUE LAWS: a term applied to laws aiming to secure an impracticable or fictitious morality, some of them severe, enacted in the 17th c. in some of the New England colonies, especially to laws of the New Haven and Connecticut colonies. No code was ever enacted under the name B. L., but the Rev. Samuel A. Peters—a tory minister of the Episc. Church, compelled by the American revolution to flee to England—published 1781 an untruthful *General History of Connecticut,* in which he misrepresents the actual laws in a sketch of such a code for the sake of making

non-conformists obnoxious. The term *blue* was applied reproachfully, in the time of Charles II., to those professedly virtuous and conscientious; thus in Butler's satire *Hudibras:*

> 'For his religion, it was fit
> To match his learning and his wit;
> 'Twas Presbyterian true blue.'

Severe and cruel penalties for even many non-criminal acts were common in all countries at the time, and not at all peculiar to New England. In England under James I., there were defined 31 offenses with death penalties, which in 1819 had increased to 223. The first code of Massachusetts, 1641, of Connecticut, 1642, named only 12 capital offenses, reserving discretion to the courts in even these cases—making New England here more than a century in advance of England. The New England colonists in general took the Mosaic 'code' for their model. Laws similar to Massachusetts, including a statute making conspiracy against the commonwealth a capital offense, were enacted in Connecticut. There were laws punishing, by fine or imprisonment, idleness, lying, gaming, contempt of God's word, etc. Though indefensible in some cases, in general the laws were beneficial. (See *Blue Laws, True and False*, ed. by Trumbull; Hartford, 1876.)

BLUE'-MANTLE: title of an English pursuivant-at-arms: see PURSUIVANT.

BLUE MONDAY: the Monday before Lent, observed in Europe in the 16th c. as a holiday, when the churches were trimmed with blue. The observance gave rise to social excesses, and was abolished.

BLUE MOUNTAINS: (1) a mountain-chain in New South Wales. This chain runs very nearly parallel with the coast, and being impassable by nature, long threatened to cut off the maritime part of the colony from the interior. To cross this apparently insurmountable barrier was the great aim of the colony during the first 24 years of its existence; it was not till 1813 that a practicable passage was found, or rather made, for it terminated toward the w. in a zigzag road down a nearly perpendicular height of 670 ft; but it was not till 1815, Apr. 25, a route was actually opened into the Bathurst Plains, then yielding the richest pasturage in the colony, and now forming its gold-field. The highest point of the B. M., Mount Beemarang, is 4,100 ft. high. A line of railway crosses the B. M., in the construction of which great engineering difficulties have been overcome, part of it being carried along the face of a precipitous mountain. (2) A range of mountains in Jamaica, traversing the whole length of the island, and in some places attaining an altitude of 7,000 ft. (3) A beautiful wooded range of mountains in Oregon, from 8,000 to 9,000 feet high, which, with the Powder River Mountains, separate the Columbia River valley from the Great Basin; (4) the second main ridge of the Appalachians, known also as the Kittatinny Mountains in Pennsylvania, as the Shawangunks in New

York. This range should not be confounded with the Blue Ridge (q.v.).

BLUE-PE'TER [Eng. *blue*, and *peter*, orig. *repeater*]: blue flag bearing in the centre a white square; it is hoisted to the head of the royal mast of merchantmen, to betoken that the vessel is in readiness to set sail, and that it is time for all hands to come aboard.

BLUE PILL (*Pilula hydrargyri*): the most simple form in which mercury can be administered internally. It consists merely of *two* parts of mercury rubbed up with three parts of conserve of roses, till globules of mercury can no longer be detected; to this is added powdered licorice-root, so that a pill of five grains contains one grain of mercury.

In cases of torpid condition of the liver or inflammation of that organ, B. P. is used as a purgative, either alone or combined with some other drug, such as rhubarb. When it is given with the view of bringing the system under the influence of mercury (Salivation, q.v.), small doses of opium should be added to counteract its purgative tendency, and the state of the gums watched carefully from day to day, so that the first symptoms of salivation may be noticed, and the medicine omitted. As a purgative, the common dose of B. P. is one or two pills of five grains each, followed by a purgative draught; but the use of B. P. is always attended with danger, as mercury varies in effect: 3 pills taken one on each of 3 successive nights have brought on fatal salivation. When taking blue pills, all sudden changes of temperature should be avoided; and, indeed, though they are found in every domestic medicine-chest, neither they nor any other form of mercury should be given without good cause and without the greatest caution. The use of B. P. is far less frequent now than formerly.

BLUE RIDGE: the most easterly range of the Alleghanies. It forms an almost continuous chain from West Point in New York down to the n. of Alabama, through New Jersey, Pennsylvania, Virginia, the Carolinas, and Georgia. In Pennsylvania and Maryland it is called South Mountain: in North Carolina the chain has the name of Black Mountains (q.v.). It divides Virginia into Eastern and Western. Mount Mitchell, in N. C., the loftiest point of the B. R., is 6,701 ft. above the sea: the Otter Peaks in Virginia have an altitude of 4,200 ft.

BLUE RIVER, or BAHR-EL-AZBAK: see NILE.

BLUE STOCKING: a name given to learned and literary ladies, who display their acquirements in a vain and pedantic manner. The name is derived from a literary society formed in London about 1780, which included both men and women. A gentleman of the name of Stillingfleet, who was in the habit of wearing blue stockings, was a distinguished member of this society; hence the name, which has been adopted also in Germany and France.

BLUE'THROAT, or BLUE'BREAST—called also Blue-

throated Warbler and Bluethroated Robin (*Cyanecula Suecica*, or *Sylvia Suecica:* see SYLVIADÆ: a beautiful bird, very little larger than a redbreast, and much resembling it, but having the throat and upper part of the neck of a brilliant sky-blue, with a spot in the centre, which in some specimens is pure white, and in very old males is red. Below the blue color is a black bar, then a line of white, and again a broad band of bright chestnut. The B. is well known as a summer bird of passage in many parts of Europe, from the Mediterranean Sea to the Arctic Ocean, but is very rare in Britain. It is supposed to spend the winter in Africa. Great numbers are caught for the table in Lorraine and Alsace. The bird is one of those known by the names of *Becfin* (q.v.) and *Beccafico* (q.v.), and esteemed a delicacy. It is a bird of very sweet song. It imitates to an unusual degree the notes of other birds, so that the Laplanders give it a name which signifies the bird of a hundred tongues.

BLUE VITRIOL: the common name for crystallized copper sulphate, $CuSO_4$, $5H_2O$.

BLUE'WING: according to some naturalists, a genus of *Anatidæ*, which has been named *Cyanopterus* (by a sort of Greek translation of the English name), but more generally regarded as a mere section or subsection of the restricted but still large genus *Anas*. See DUCK. The tail-feathers are only 14 in number, instead of 16, as in the common duck, teal, etc.; but the character from which the name is derived is, after all, that which chiefly distinguishes the bluewings, and never fails to arrest attention. The best known species, the Common or Lunate B. (*Anas* or *Cyanopterus discors*), is generally called the blue-winged teal in the United States, where it is very abundant. Vast numbers spend the winter in the extensive marshes near the mouths of the Mississippi, to which they congregate both from the north and from the coast regions of the east; but the summer migrations of the species extend as far north as the 57th parallel, and it is plentiful on the Saskatchewan in the breeding-season. It breeds also in the marshes of the south, even in Texas; and is common in Jamaica, where it is supposed to be not a mere bird of passage, but a permanent resident. None of the duck tribe is in higher esteem for the table, and it has therefore been suggested that the B. is particularly worthy of domestication, of which it seems very easily susceptible. In size it is rather larger than the common teal; in the summer plumage of the male, the upper part of the head is black, the other parts of the head are of a deep purplish blue, except a half-moon shaped patch of pure white before each eye; the prevalent color of the rest of the plumage on the upper parts is brown mixed and glossed with green, except that the wings exhibit various shades of blue, the lesser wing-coverts being of a rich ultramarine blue, with an almost metallic lustre; the lower parts are reddish orange spotted with black; the tail is brown, its feathers short and pointed.—The B. is a bird of extremely

rapid and well-sustained flight. The flocks of the B. are sometimes so numerous and so closely crowded together on the muddy marshes near New Orleans, that Audubon mentions having seen 84 killed by the simultaneous discharge of the two barrels of a double-barreled gun.—There are other species of B., also American; but this alone seems to visit the more northern regions.

BLUFF, n. *blŭf* [Dut. *blaf*, plain, level, not sloping but rising straight up]: a high steep bank generally facing the sea or a river: ADJ. abruptly rising as a shore; big; vainglorious; downright; plain and homely; rough; swaggering; blustering. BLUFF'LY, ad. *-lĭ*. BLUFF'NESS, n. the quality of being bluff; surliness. BLUF'FY, a. *-fĭ*, having bold projecting points of land. BLUFF-HEADED, not pointed; obtuse—applied to a ship that has her stem too straight up. BLUFF-BOWED, *-bowd*, applied to a vessel having broad and flat bows.

BLUHME, or BLUME, *blû'mė*, FRIEDRICH: GERMAN jurist: 1797–1874; b. Hamburg. After studying law at Halle, Göttingen, and Jena, he travelled in Italy as a philosophical investigator: see his *Iter Italicum* (4 vols. 1824–37); etc. He was prof. of jurisprudence at Halle, at Göttingen, and at Bonn; and pub. important works on that subject.

BLUM, *blŭng*, ERNEST: French dramatist: b. Paris, 1836, Aug. 15. Either alone or in collaboration with other dramatists he is the author of many highly successful plays. The drama of *Rose Michel* (1877), of his own composition, insured his place among the most successful French dramatists of the time. Among his later compositions are *Adam and Eve* (1886); *The Nervous Woman* (1888); *End of the Century* (1890); *La rieuse* (1894); *Le Carillon* (1897).

BLUM, *blôm*, HANS: German publicist: b. Leipsic, 1841. He is a son of Robert Blum (q.v.), was educated in the universities of Leipsic and Bern, sat in the North German Reichstag 1867–70, and was a barrister in Leipsic 1869–97. He has written extensively on contemporary politics and among his works are *Die Lügen unserer Socialdemokratie* (1891); *Fürst Bismarck und seine Zeit* (1894–5); *Das erste Vierteljahrhundert des deutschen Reichs* (1896); *Persönliche Erinnerungen an den Fürsten Bismarck* (1900). He has also written two dramas and several novels.

BLUM, *blûm*, ROBERT: 1807, Nov. 10—1848, Nov. 9; b. Cologne, of a family in very humble life. After a brief military service in 1830, he was employed in a theatre; and 1847 became a bookseller and publisher. In 1840, he founded at Leipsic a soc. celebrating Schiller's anniversary, in honor of political liberty. In 1845, in the political outbreaks of Leipsic, he acquired great repute as a popular orator; and 1848 was elected vice-pres. of the provisional parliament at Frankfort. Joining in the insurrection at Vienna, Oct., 1848, he was arrested and shot. B. was a man of strong character, of great natural intelligence, and a speaker of stirring eloquence.

BLUM, *blûm*, Robert Frederick: artist: b. Cincinnati 1857, July 9; d. 1903. He studied in New York and in Europe; and after a sojourn in Holland, Venice, and Japan, opened a studio in New York. He was elected Academician 1893; and was made pres. of the Soc. of Painters in Pastel. His brilliant water-colors and pastels early gave him high rank as a painter, especially in figure-pieces. His work in oil also is notable for delicacy of color. His Venetian and Spanish pictures are of recognized excellence—*Venetian Bead Stringers* having received a prize of $2,500 at the Amer. Art Assoc. exhibition, New York 1889. His work gained recognition (with medals, etc.) at New York 1888, Philadelphia 1888, Paris 1889, Chicago 1893.

BLUMENBACH, *blô'mĕn-bâk*, Johann Friedrich: 1752, May 11–1840, Jan. 22; b. Gotha: eminent naturalist. He studied at Jena and Göttingen, in the latter of which universities he became extraordinary prof., 1776, and ordinary prof., 1778. Here he lectured for 50 years on natural history, comparative anatomy, physiology, and the history of medicine. In 1785, consequently before Cuvier, he made natural history dependent on comparative anatomy, thus placing it on a scientific basis. His *Manual of Comparative Anatomy and Physiology* has been translated into almost all the principal languages of Europe (see Ethnology). He published many other works on natural history. His *Manual of Natural History* (1780) went through 12 editions in 50 years. In 1825, Sep. 19, his friends celebrated the jubilee of his doctorate, presenting him with a medal struck for the occasion.

BLUMENREICH, *blô-mĕn-rīch*, Franziska, German b. Bohemia, 1849, April 2. Among her very numerous novels novelist: the more notable are *At the Abyssof Marriage* (1888);*Freighted with Bliss* (1890); *Storms in Port* (1892) She is a zealous advocate of woman's rights.

BLUMENTHAL, *blô-mĕn-täl*, Jacob von, German pianist and composer: b. Hamburg, 1829, Oct. 4. Going to London in 1849, he became pianist to Queen Victoria, taught music, and was soon well known as a composer of popular pianoforte numbers and equally popular songs such as *My Queen; The Venetian Boat Song; The Broken Flower; The Bend in the River.* The familiar hymn tune, *Blumenthal*, is an adaptation of his composition, *The Two Angels.*

BLUMENTHAL, Leonard von: Prussian field-marshal: 1810, July 30—1900, Dec. 21; b. Schweldt, on the Oder: one of the most distinguished strategists of modern times. He was educated 1820–27 in the milit. academies at Culm and Berlin; entered the army as 2d lieut. 1827; was as capt. transferred 1849 to the general staff, in which he rapidly rose—being made chief-of-staff in the Schleswig-Holstein army 1849; major in the grand general staff 1853; adjt. of Prince Frederic Charles 1859; col. 1860; chief of the general staff of the combined army against Denmark 1863; maj.gen. 1864; division commander

1866; chief of general staff of the 3d army in the war with France; field-marshal 1888.

BLUMENTHAL, Oskar, German dramatist and critic: b. Berlin 1852, March 13. Sprightliness of dialogue is the most distinguishing character of his plays; the most successful of them are *The Big Bell; A Drop of Poison; The Black Veil.* He has published several volumes of critical and miscellaneous essays.

BLUNDELL, (Mrs.) Francis (M. E. Francis), English novelist: b. Dublin. She is the widow of Francis N. Blundell and has lived for many years in Lancashire, but more recently in Dorsetshire. Her writings, which have steadily increased in popularity, both in England and the United States, are: *Whither?* (1892); *In a North Country Village* (1893); *The Song of Dan* (1894); *Town Mice in the Country, a Story for Children* (1894); *A Daughter of the Soil* (1895); *Frieze and Fustian* (1896); *Among the Untrodden Ways* (1896); *Maime o' the Corner* (1897); *Miss Erin* (1898); *The Duenna of a Genius* (1898); *Yeoman Fleetwood* (1899); *Pastorals of Dorset; Fiander's Widow* (1901); *North, South, and Over the Sea; The Manor Farm* (1902).

BLUNDER, n. *blŭn'dėr* [Dan. *pludder*, earth and water mixed together—hence confusion, trouble: Icel. *glundra*, to disturb—from *glundr*, sloppy drink]: a gross mistake; a stupid error: V. to mistake grossly; to err stupidly; to act without reflection. Blun'dering, imp.: Adj. stupid; floundering. Blun'dered, pp. *-dėrd.* Blun'derer, n. *-dėr-ėr*, one who. Blunder head, n. *-hĕd*, a stupid fellow. Blun'deringly, ad. *-lĭ. Note.*—Skeat suggests the derivation in a different direction: Icel. *blundr*, to doze, to slumber: Sw. and Dan. *blund*, a doze, a nap —as 'to pore over a thing sleepily,' 'to err.'

BLUNDERBUSS, n. *blŭn'dėr-bŭs* [Dut. *donderbus* from *donder*, thunder; *bus*, a firearm; Ger. *donnerbüchse*, thunder-gun]: a short, wide-mouthed, very noisy musket with bore wide enough for several bullets; very destructive at close quarters. Since the 17th c. it has entirely passed out of use.

BLUNGER, n. *blŭn'jėr* [Etymol. doubtful, compare Gr. *amblys*, blunt, dull, and provincial Ger. *bludde*, a dull or blunt knife]: a plunger, a wooden blade with a cross handle, used for mixing clay in potteries. Blunging, *blŭn'jing*, corrupted from *plunging.*

BLUNT, a. *blŭnt* [Sw. *blott*, naked, bare: Swiss, *bluntsch*, the sound of a round heavy body falling into the water plump; *bluntschi*, a thick and plump person: Ger. *plump*, rough, heavy, dull]: dull; not sharp; having a thick edge; plain; unceremonious; wanting in manners: V. to take away the sharpness of an edge; to weaken any appetite or passion; to impair any power or affection of the mind. Blunt'ing, imp. Blunt'ed, pp. Blunt'ly, ad. *-lĭ*, plainly; without circumlocution; roughly. Blunt'ness, n. dullness; want of sharpness: the state of having an

unpolished, unceremonious manner. BLUNT-WITTED, dull; stupid.

BLUNT, n. [F. *blond*, white]: a slang word for silver money from its color.

BLUNT, *blŭnt*, EDMUND: hydrographer: 1799, Nov. 23—1866, Sep. 2; b. Newburyport, Mass.; son of Edmund March B. He early interested himself in applied mathematics, making, at the age of 17, the first trustworthy survey of New York harbor; three years later the survey of Nantucket shoals; and 1824 of the ocean approaches of New York harbor. He ran the levels for the w. portion of a ship canal on the Nicaragua route 1825–6, and surveyed the whole of Long Island Sound 1827–30. From 1832 till his death he was first assist. of the U. S. coast survey. He urged (1838) the adoption of Fresnel's signal-light system.—His bro. JOSEPH B. (1792–1860) was an eminent lawyer and statistical and historical writer; and one of the founders of the repub. party. He died in Brooklyn.

BLUNT, EDMUND MARCH: 1770, June 20—1862, Jan. 2; b. Portsmouth, N. H.: hydrographer and nautical publisher. His *American Coast Pilot* (1st ed. 1796), with descriptions of all ports in the United States, showing light-houses, sailing directions, etc., rendered such invaluable service to navigation that it has passed through about 30 editions, has been translated into various European languages, and is still in use. He died in Sing Sing, N. Y.

BLUNT, GEORGE WILLIAM: hydrographer and nautical publisher: 1802, Mar. 11—1878, Apr. 19; b. Newburyport, Mass.; son of Edmund March B. From the age of 14 for about 7 years he was a sailor; then for more than 40 years, as partner with his bro. Edmund, publisher of charts, etc., in New York. He was early engaged in various marine surveys. His proposal (1834) of the Fresnel system, and his, and his brother Edmund's subsequent advocacy of it, finally led the govt. to adopt it and to establish the light-house board (1856). He served many years as pilot commissioner and New York harbor commissioner. He died in New York.

BLUNT, JAMES G., M.D.: military officer: 1826–81; b. Hancock co., Me. From the age of 15 he was a sailor five years, then studied medicine, and was a physician 1849–56 in Ohio. He then removed to Kansas, where he was an active opponent of the introduction of slavery. In 1861 he entered the army as lieut.col. 3d Kan. vols.; was promoted brig.gen. 1862, Apr. 8, in command of the Kan. milit. dept.; routed the Confederate forces in several important engagements, and was promoted maj.gen. vols. Nov. 20. In 1863 he commanded the army of the frontier. At critical points, such as Price's last invasion of Kan., Gen. B.'s troops struck decisive blows. After the war, he was a resident of Leavenworth, Kan.

BLUNT, JOHN HENRY, D.D.: Anglican theologian: 1823–1884, Apr. 11; b. Chelsea. After studying in the

univ. at Durham, he took orders 1852, and served in various parishes, resigning 1873 the crown living of Beverstone, Gloucestershire. Dr. B. was a most prolific writer.

BLUNT, JOHN JAMES: Anglican theologian: 1794–1855, June 18; b. Newcastle-under-Lyme, Staffordshire. He graduated at St. John's Coll., Cambridge. He was a curate in Shropshire; then rector of Great Oakley, Essex, 1834–39; then became Lady Margaret prof. of divinity at Cambridge. He was offered, but declined, the bishopric of Salisbury 1854. Most notable of his works is his *Undesigned Coincidences in the Writings of the Old and New Testaments.*

BLUNTSCHLI, *blûntsh'lē*, JOHANN KASPAR: Swiss and German jurist: 1808, Mar. 7–1881, Oct. 21; b. Zurich, Switzerland. He became prof. in the univ. at Zurich 1833. After 1839 he was a political leader of the moderate conservatives. He held govt. offices. He was prof. of civil and international law at Munich 1848–61; thereafter prof. in Heidelberg Univ., becoming also a privy-councillor of Baden, where he was active in behalf of civil and ecclesiastical liberty. His Swiss histories are valuable. On international law he was an authority—his greatest work being *Allgemeines Staatsrecht* (5th ed. 1876).

BLUR, n. *blėr* [Bav. *plerren*, a blotch on the skin: Dut. *blaar*, a blister]: a smear or blot; a spot; a stain: V. to render indistinct by smearing; to sully or stain; to blemish. BLUR'RING, imp. BLURRED, pp. *blurd.*

BLURT, v. *blėrt* [Scot. *blirt*, a burst—as a *blirt* of greeting—*i.e.*, a burst of weeping: Dut. *blader*, a bladder: Gael. *blaor*, a cry, a shout]: to throw out suddenly with an explosive sound, as with the mouth; to throw at random; to utter words hastily and unadvisedly. BLURT'ING, imp. BLURT'ED, pp.

BLUSH, n. *blŭsh* [AS. *blysgan*, to redden: Dan. *blusse*, to flush, to blush: Low Ger. *blüse*, a blaze: Dut. *blosem*, a blossom]: a glow of red on the cheeks or face excited by a sense of modesty, shame, or indignation: V. to redden on the cheeks or face; to carry a blooming color. BLUSH'ING, imp.: ADJ. showing a blush. BLUSHED, pp. *blŭsht.* BLUSH'INGLY, ad. *-lĭ*, with blushes of modesty. BLUSH'-FUL, a. *-fûl*, full of blushes. BLUSH'FULLY, ad. *-lĭ.* BLUSH'LESS, a. without a blush; impudent.

BLUSHING: sudden reddening of the face, neck, and breast, owing to some mental shock, usually of the character of humiliation or shame. The nature and cause of this effect have been recently elucidated by physiological researches. It is produced by an increased flow of blood into the capillary vessels over the parts where the blush extends. Besides reddening the complexion, it creates a sensible augmentation of heat in those parts. The feeling that accompanies the state is of a distressing kind.

The phenomenon of B. is part of a general influence exerted on the capillary circulation by mental causes operating through the brain. The experiments whereby the

existence of this influence has been established may be described as follows: The *small blood-vessels*, by which the blood is brought into proximity with the various tissues of the body, are kept in a state of balanced distension between two forces: the one the propulsive power of the heart's action, which fills and distends them; the other, an influence derived from the nervous centres, and acting upon the muscular fibres so as to contract the vessels. The first of the two forces—the agency of the heart—is quite well understood: it is simply like the case of distending the hose of a fire-engine by working the pump, and driving the water along. The counteracting force of the nerve-centres is proved by the following experiments: When the sympathetic nerve proceeding to the vessels of the head and face of an animal is cut, there follows congestion of the blood-vessels with augmented heat over the whole surface supplied by the nerve. The ear is seen to become redder; a thermometer inserted in the nostril shows an increase of temperature, the sign of a greater quantity of blood flowing into the capillaries. The inference from the experiment is, that, from the withdrawal of a counterpoise, the force that *distends* the small blood-vessels—that is to say, the heart's action—has an unusual predominance. It is further proved that this nervous influence, acting upon the minute muscular fibres of the small vessels, proceeds from the nerve-centres lodged in the head, for, by cutting the connection between the brain and the ganglion in the neck, from which the above-mentioned nerve is derived, the same restraining influence is arrested, and the congestion takes place. By stimulating the divided nerve galvanically, the suffusion disappears, the vessels shrinking by the galvanic contraction of their muscular coats.

The agency now described is of a piece with the action of the brain upon involuntary muscles generally, as the heart and the intestinal canal, and by it many organic functions—digestion, nutrition, absorption, etc.—are affected by those changes in the cerebral substance that accompany mental states. It is known that mental excitement has an immediate influence in all those functions; one set of passions, such as fear, tends to derange them, while joy and exhilaration operate favorably upon them.

To apply these observations to the case in hand: suppose that to a person in the average mental condition, something occurs which gives a painful shock; or even an uncertain stir, to the feelings—a piece of ill news, a reproach from some one whose good opinion is much valued, an open shame, or the fear of it, a fit of remorse, an occasion of grief—the pain is accompanied with a sudden loss, or waste, or decrease of cerebral power; none of the functions that the brain aids in maintaining is so strongly stimulated as before; and in particular, that stream of nervous energy which balances the heart's action in regulating the distension of the small blood-vessels, is abated, the abatement being made apparent in the redness and heat over the face and neck. In a great stroke of mental

depression, the influence is of a much more extensive kind, though still of the same nature essentially as regards the enfeeblement of the nervous energy, and may lower the action of the heart itself; in which case there will be a widespread pallor, perhaps without a blush. In all probability, it is when the loss of cerebral influence extends only to the relaxation of the muscular fibres of the small vessels, leaving the heart in its usual vigor, that the state of B. is most fully manifested. A further theory is that the fulness of blood in the brain, caused by mental excitement, is relieved by blushing; as also the flush in mental work.

It is said that, in the Circassian slave market, a young woman that blushes fetches a higher price. Some complexions do not show the increased flow of blood in this way, and all persons are not equally sensitive to the cerebral shock that causes it.

BLUSTER, n. *blŭs'tėr* [Gael. *bladhastair*, a blusterer, a bully—from *blad*, an abusive mouth: Bav. *blasten* or *blaustern*, to snuff, to be out of temper: Icel. *blástr*, a blast]: violent puffs; noise, tumult; irregular noise from idle boasting and vainglorious talk; swagger; fitful gusts of wind: V. to blow in puffs; to be loud and noisy in talking; to puff; to bully; to swagger. BLUS'TERING, imp.: ADJ. noisy; boastful; windy: N. much noise; tumult. BLUS'TERED, pp. *-tėrd*. BLUS'TERER, n. one who. BLUS'TERINGLY, ad. *-lĭ*.

BLUTEAU, *blū-tō'*, DOM RAPHAEL: 1638–1734; b. London: Portuguese lexicographer of French extraction. After completing his studies in England, he became preacher to Henrietta Maria, queen of Charles I. He returned to Portugal, then to Paris, and finally established himself at Lisbon, where he was elected member of the Acad. Being thoroughly acquainted with the Portuguese language, he published an excellent Portuguese-Latin dictionary, *Vocabulario portuguez e latino*, etc. (1712–21, 8 vols., folio), with 2 vols. of supplement, and preceded by 50 prefaces for so many different classes of readers.

BOA, n. *bō'ă* [It. *boa* or *bora*, any filthy mud, a venomous serpent that lives in mud: L. *boa*, plu. *boæ*, serpents of immense size—said to be from *bos*, an ox, in allusion to the great size of the animal]: general name for the largest kind of serpents; a fur cravat for the neck. BOA-CONSTRICTOR, n. *-kŏn-strĭk'tėr*, a powerful boa, a native of S. America. *Note.—Boa*, one anc. authority says, is so named because supposed to suck the milk from cows, and according to another, because it swallows cattle entire.

BO'A: in popular language, the name of all those large serpents which kill their prey by entwining themselves around it, and constricting it in their coils; but by zoologists of the present day, limited as the name of a genus to a very small portion of their number, all of which are natives of the warm parts of America—the similar large serpents of Asia and Africa forming the genus *Python* (q.v.),

The name B., however, was certainly not originally applied to American serpents, for it is used by Pliny, who accounts for its origin by a fable of serpents sucking the milk of cows, thus referring it, very improbably, to the Latin *bos*, an ox. The Linnæan genus B., comprehended all serpents having simple subcaudal plates, but without spur or rattle at the end of the tail, and was thus very artificial as founded chiefly upon a single unimportant character, and consisted of a very miscellaneous assemblage of species, venomous and non-venomous. The B. family, or *Boïdæ*, as now constituted (containing the *Pythons*, etc., of the old world, as well as the true *Boas* of the new), is almost exclusively confined to tropical climates, and all the species are of large size and great strength, some of them far exceeding in these respects all other serpents. The *Boïdæ* are not venomous; but their mouth, although destitute of poison-fangs, is so furnished with teeth as to make their bite very severe. Their teeth are numerous, long, and directed backward, so as the more effectually to prevent the escape of the prey, which is first seized by the mouth, and then the serpent, with a rapidity of motion which the eye of the closest observer fails perfectly to follow, coils itself around it; the powerful muscles of the body are afterward brought into action to compress it, so that usually in a few minutes its life is extinct, and its bones are broken. Deglutition then takes place—not, as has been alleged, after the prey has been licked and covered with saliva by the tongue, but accompanied with an extraordinary flow of saliva, which seems not only to serve for lubrication, but to have the property of hastening the decomposition of animal substances, and so to assist in making the prey more easy to be swallowed. It is always swallowed entire, and the process is sometimes rather a tedious one, and seems to require no small muscular effort; but the muscles of the serpent are capable of acting for this purpose, even at the neck, when that usually narrowest part of the body is distended to an enormous degree as the prey passes through it. The lower jaw is not simply articulated to the skull but by the intervention of other bones, a structure without which the prodigious dilatation of the throat would be impossible. The lungs consist of two lobes, one much larger than the other, and at the extremity of the larger is an extremely capacious air-bag, which is supposed to serve for the necessary aëration of the blood while respiration is impeded in the process of deglutition.

The tail in all the *Boïdæ* has great prehensile power, and its grasp of a tree round which it may be coiled is aided by the opposing action of two claws, one on each side of the anus, which are really the representatives of the hinder limbs of the superior vertebrate animals, and which, on dissection, are found to be connected not only with strong muscles, but with bones entirely concealed within the serpent, one jointed to another, so as to make the character of a rudimentary limb very apparent. These

serpents, being almost all inhabitants of watery places, often lie in wait for animals that come to drink; thus the largest of the American species, *Boa* (*Eunectes*) *murina*—sometimes called Anaconda, although Anaconda seemed to be originally, like B., the name of a serpent of the old world—is to be found where rivers or narrow lagoons are overshadowed by gloomy forests. Perhaps the want of sufficient supplies of water, more than the greater cold of the climate, may account for the short time that specimens of the *Boïdæ* brought to Europe have generally lived in confinement.

After a repast, these serpents spend a considerable time in a state of comparative torpidity—several weeks generally elapsing before they waken to require a new supply—and in this lethargic state they are easily killed. When they do waken, the demands of appetite seem to be very urgent.

The head in the *Boïdæ* is thick, yet somewhat elongated; the eyes are small; the body is thickest in the middle; the tail usually has a blunt termination. The scales are numerous and rather small. The colors are various, and in many of the species rather bright and elegantly disposed. The true boas have the plates underneath the tail single, while in the pythons they are double. The species to which the name *Boa Constrictor* is appropriated is far from being one of the largest, seldom attaining a length of more than 12 ft. It is common in Surinam and Brazil, where its skin is used for making boots and saddle-cloths. The name *Boa Constrictor* is, however, popularly extended to almost any of the species.—The number of species, whether in the genus or in the family, is far from being well ascertained.

Boas are much infested by intestinal worms, which appear often to cause their death. The excrement of the B.—the urine and fæces being combined as in other reptiles and voided by a single vent—is a solid white substance, and consists mainly of urate of ammonia, accompanied by phosphate of lime (bone-earth). It is employed as an easy source of uric acid.

BOADICEA, *bō-ad-ĭ-sē′a:* warrior-queen of the Iceni, a tribe inhabiting the e. coast of Britain, in the time of the Romans. She lived after the middle of the 1st c. Prasutagus, her husband, who died A.D. 60, or 61, had left his wealth jointly to the Roman Emperor Nero and to his two daughters, hoping that by this artifice his kingdom would be protected from oppression; but the Roman soldiery, taking advantage of the defenseless condition of the country, began to plunder unscrupulously. B. herself was scourged, her daughters were violated, and the noblest among the Iceni were treated as slaves. These outrages soon drove the Britons to revenge. B. gathered round her a large army; attacked and captured the Roman colony of Camalodunum; defeated Petilius Cerealis, legate of the ninth legion, who was marching to its relief; took Londinium and Verulamium; and destroyed, it is said, about

70,000 Romans, many of them by torture. Suetonius, the Roman governor of Britain, now advanced at the head of 10,000 men against B., who, we are informed, had under her command no less than 263,000. A dreadful battle ensued (A.D. 62) in which, according to Tacitus, 80,000 Britons perished, and only 400 Romans. These figures, of course, cannot be trusted; but the victory must have been decisive, as it finally established the authority of the Romans in Britain. B., overwhelmed with despair, committed suicide.

BOAR, n. *bōr* [AS. *bar;* Dut. *beer*, a boar: L. *aper*, a wild boar: Ger. *eber*]: the male *swine;* fem. *sow.* BOAR'ISH, a. like a boar. BOAR-FISH, a sea-fish, *capros aper*, something like a John-dory.

BOARD, n. *bōrd* [Gael. and AS. *bord;* Icel. *bord;* Dut. *berd;* Ger. *brett*, a board or plank: Dut. *boord*, a margin or border]: a slab or flat piece of wood sawn from a log; a table; food or diet; a council, or meeting of managers convened for business; the deck of a ship. BOARDS, n. plu. *bōrdz*, planks; the covers of a book; the line over which a ship runs between tack and tack. BOARD, v. to cover with flat pieces of wood; to enter a ship by force; to furnish with food and lodging for a price; to lodge; in *OE.*, to attack; to accost [F. *aborder*, to touch, to attack]. BOARD'ING, imp. BOARD'ED, pp. a. PASTEBOARD, layers of paper pasted together to make a board. BOARD'ER, n. one furnished with food at a price; one who boards a ship in action. BOARD'ABLE, a. *-ă-bl*, that may be boarded. TO FALL OVERBOARD, to fall over a ship's side. THE WEATHER BOARD, the side of a ship which is to windward. BOARD-RULE, a figured scale for finding the number of sq. ft. in a board without a formal calculation. BOARDING-HOUSE, a house in which persons are provided with lodging and food for a price. BOARD-WAGES, money given to servants when they provide food for themselves. BOARDING-NETTINGS, strong cord nettings designed to prevent a ship from being boarded in battle. BOARDING-PIKE, a weapon used by sailors in boarding an enemy's ship. TO MAKE SHORT BOARDS, to tack frequently. SEA-BOARD, the border or margin of the sea. STARBOARD, right-hand side. LARBOARD, the left-hand side; port: see LARBOARD: STARBOARD. BOARDING-SCHOOL, a school where the pupils are lodged, educated, and provided with food for a price. ON BOARD, in a ship. BED AND BOARD, sleeping accommodation and victuals at table. IN BOARDS, in pasteboard sides and paper covers, applied to the binding of a book, in contradistinction to one covered with cloth or leather. BY THE BOARD, over the side. BOARD OF CONTROL, six privy councilors formerly appointed to superintend all the affairs of the British E. Indies, abolished 1858. BOARD OF TRADE, in Great Britain a committee of privy council which supervises all matters connected with the commerce of the United Kingdom—pl. BOARDS OF TRADE: see TRADE, BOARD OF.

BOARD, n. *bōrd*, in *mining* [see BOARD 1]: the gallery

or drift in a coal-mine cut across the face of the coal; hence the term 'board and pillar working.'

BOARD: general name for persons in their collective capacity, who have the management of some public office or department, bank, railway, charity, or indeed of any other trust. Thus, the commissioners of excise, when met for the transaction of business, are called the B. of Excise; directors of railways, B. of Directors; and in England, the lords of the treasury, the B. of Treasury, etc.

BOARD—BOARDING: in nautical language, having many significations. Besides the ordinary application of *board* to a plank of wood it is applied also to a space or portion of sea over which a ship passes in tacking; hence the phrases 'to make a good board,' 'to make short boards,' 'to make a stern-board,' 'to leave the land on back-board,' etc.—all of which refer to the direction of a ship's movement at a particular time and place. Again, *board* or *aboard* relates to the interior of the ship, in such phrases as 'to go aboard,' 'to heave overboard,' etc.

But the most important of these meanings is that which relates to the *boarding* of an enemy's ship, or making a forcible entry for the sake of capturing it. Whenever this bold operation is determined on, certain seamen are told off to act as boarders. It is very rarely that, between two men-of-war, this operation is ventured on; it would in most cases, be too perilous to the assailants, who more frequently conquer by cannon and musketry. Boarding is, in most instances, attempted by privateers against merchantmen, where the defenders are few in number. The assailant well considers all the circumstances for and against him—the relative sizes of the two vessels, the relative strength of the crews, the state of the wind and sea, and the chances of escape if foiled. Besides the pistols, cutlasses, and boarding-pikes of the seamen, there are provided powder-flasks for producing smoke and confusion on the enemy's deck, and shells called stink-pots, for producing an intolerable stench. The moment and the spot being selected, the fuses of the flasks and stink-pots are lighted; these combustibles are thrown upon the enemy's deck; and while the fire, smoke, and stench are doing their work by confusing the enemy, the boarders climb on board, and gain a mastery by their personal prowess—that is, if the calculations of relative strength have been duly made. Sometimes terrible hand-to-hand encounters take place on deck before victory decides for or against the assailants.

BOARDMAN, *bōrd'man*, George Dana: Baptist missionary in Burma: 1801, Feb. 8—1831, Feb. 11; b. Livermore, Me. He graduated at the college in Waterville, Me., 1822, and at Andover Theol. Sem.; and was ordained a Bapt. minister 1825, Feb. 16. Having devoted himself to missionary work, he went to Calcutta 1825, studied the Burmese language, and organized 1827, May, a mission at Maulmain, in Burma, which became the nucleus of the

extensive and successful Bapt. missions in that country. He was successful, but his unremitting labors caused his early death. His widow married Adoniram Judson, D.D. (q.v.).

BOARDMAN, GEORGE DANA, D.D., LL.D.: Baptist minister: 1828, Aug. 18—1903, Apr. 28; b. Tavoy, Burma; son of George D. B., missionary to Burma, and step-son of Adoniram Judson, D.D. (q.v.). He graduated at Brown Univ. 1852, and at Newton Theol. Institution, Mass., 1855; and became pastor at Barnwell, S. C.; but the slavery question soon (1856) caused his acceptance of the pastorate of the 2d Bapt. Chh. in Rochester, N.Y., whence he removed 1864 to the 1st Bapt. Chh. in Philadelphia. He gained wide repute as a writer; among his many books are *Studies in the Creative Week* (1878); *Studies in the Model Prayer* (1879); *Epiphanies of the Risen Lord* (1879); *The Mountain Instruction* (1880); *The Divine Man* (1887). Many of these, delivered as lectures, drew great audiences.

BOAR'-FISH (*Capros*): genus of fishes of the family *Caproidæ*. It somewhat resembles the Dory (q.v.), but differs from it in the still more protractile mouth—the resemblance of which to the snout of a hog is supposed to have given origin to the name—in the want of spines at the base of the dorsal and anal fins, and of long filaments to the dorsal spines. The body has the usual oval, much compressed form of the family. The common B. (*C. Aper*) is a well-known inhabitant of the Mediterranean, rarely caught on the coasts of England. The eyes are very large, and placed far forward; the body is of a carmine color, lighter below, and with seven transverse orange bands on the back. The flesh is little esteemed.

BOAR'S HEAD: the subject of a variety of legends, poetic allusions, and carols connected with the festivities of Christmas in England: see CHRISTMAS. At this wintry season, the wild boar was hunted, and his head served up as the most important dish on the baronial table.

In the 'boar's-head carols' are found some of the most interesting specimens of the old English convivial verses.

The boar's head 'erased,' according to heraldic phraseology, is a well-known cognizance of a number of old families, particularly the Gordons; it also formed the sign of a tavern at Eastcheap, London, which has been immortalized by Shakespeare. It was destroyed in the great fire of 1666, and on its site stands the statue of William IV.

BOAST, v. *bōst* [Ger. *pausten*, to swell the cheeks: W. *bost*, a bragging: Dut. *pof*, the sound of a blow; *poffen*, to puff, to brag: Scot. *boost*, the crack made by bursting open: Gael. *bosd*, to boast—*lit.*, to give a crack or loud sound, implying emptiness]: to speak in high praise of one's self; to speak in exulting language of another; to brag; to vaunt: N. a brag; self-praise or commendation; occasion of exultation; exaggerated or ostentatious expression. BOAST'ING, imp.: ADJ. ostentatious in words; glorying; vaunting: N. the act of boasting. BOAST'ED, pp. BOAST'INGLY, ad. *-lĭ*.

BOAST'ER, n. one who. BOAST'FUL, a. *-fûl*, given to boasting. BOAST'FULLY, ad. *-lĭ*. BOAST'FULNESS, n. BOAST'ING, n. [F. *ebaucher*]: the paring of stones by stone-cutters with the broad chisel; the blocking out a piece of stone or wood to form a rude approach to the ultimate figure; among *carvers*, the rough cutting round the ornaments, to reduce the whole to their proper contour or outlines.—SYN. of 'boast, v.': to vaunt; bluster; brag; crow; vapor; glory;—of 'boast, n.' and 'boasting, n.': brag; vaunt; vaunting; glorying; ostentation; swagger; swaggering; gasconade; rhodomontade; vaporing; bluster; parade.

BOAT, n. *bōt* [AS. *bat;* Dut. *boot;* Icel. *batr;* F. *bateau*, a boat: Gael. *bâta*, a boat]: a small open vessel for sailing on water: V. to sail in a boat. BOAT'ING, imp.: N. sailing or rowing in a boat. BOAT'ED, pp. BOAT-HOOK, n. a long pole hooked with iron to pull or push a boat. BOAT-SHAPED, a. in appearance like a boat. BOAT-FLY, an insect, so called from swimming in water on its back. IN THE SAME BOAT, treated alike; placed in the same circumstances. BOAT-SHELL, the English name of the shell ranked under the genus *Cymba* (q.v.). BOAT-BILL, a S. Amer. bird with a large and extraordinary beak.

BOAT: general name for a small open vessel for navigation; sometimes applied also to large vessels, as steamboats.

After the raft, the first idea of a boat probably took the shape of the canoe, or dugout; made from a log of wood, hollowed out by fire and tools, and shaped to as good a model as practicable (see CANOE). The Catamaran, made of three logs fastened together side by side, is another approach to the boat. The primitive boat, Coracle, still in use on the British islands, has a framework almost circular, over which a waterproof covering is stretched. This tub-like craft is worked with much skill by a paddle. Modern boats are usually of wood. A framing consisting of keel and ribs lying in planes at right angles thereto is first set up, and to this the planks are secured, in general longitudinally, by wooden pins, nails, or rivets. The planks may be laid edge to edge (carvel-built—see CARVEL), or the lower edge of each plank may lap over the upper edge of the next (Clincher-built—q.v.). Sometimes two layers of planking are used. One set is fastened over the other, breaking joints so as to give a double thickness. Varnish or oils is applied between the two layers. Another system dispenses with ribs. Thin wood, in two or three layers crossing each other diagonally, acts as skin and as frame. Sometimes iron, corrugated in the general direction of the seams, is used to cover the ribs. Paper boats are covered with sheets of paper laid on a model of the exact shape of the interior of the boat: the sheets are laid on so as to break joints. They are secured and made watertight by varnish and oil. A recent material suggested for the outside covering of boats is sheet aluminium. The covering of boats is often termed the skin.

In shape, the simplest type of boat is the punt, or scow, flat-bottomed, with square ends. In the next advance the bow is made sharp, giving the batteau, called sometimes sharpie, skiff, or flatty. In advance of these are the oyster and sea-skiffs of the N. J. and L. I. coasts. These have flat bottoms with rounded sides, sharp bow, and overhanging flat stern. They are excellent sea-boats, and their model has been adopted for the boats in the life-saving service of the Atlantic coast (see LIFE-BOAT). The Norwegian skiffs are of much the same type, but very heavily built, with almost semi-circular cross section, and are put together with wooden pins (tree-nails). The whale-boat a development of the whaling industry of New Bedford and Nantucket and elsewhere, is double ended, with very fine model, and so celebrated for good qualities that it has been adopted in the U. S. navy.

Launch is the largest boat carried by a man-of-war. Long boat, used by merchant vessels for conveying heavy burdens; this name is given to the largest boat, without regard to size. Cutter, shorter and lighter than the launch, and much faster. Jolly boat, smaller than the cutter, and not so fast, used for going on shore, usually rowed with four oars. Gig, a fast-rowing boat nearly the size of the cutter, employed both in the merchant service and navy. Barge, in the English navy, about the size of the cutter. This name is given to the large boats used on occasions of state. On the Mississippi it means a scow, flat-bottomed, and of very light draught. Sometimes also applied to the large 8- and 10-oared race boats. Pinnace, smaller than the barge, used for conveying light articles. In the English navy the pinnace launch is next in size to the launch. Dory, light, flatbottomed, very sharp, with sloping sides, from 15 to 20 feet long, used very extensively in the fisheries. Wherry, in the United States, a dory; in England, a race boat for one rower, and from 15 to 30 feet long.

The racing and exercise boats are simply developments of the working craft: they are very narrow and long. To give the oars sufficient bearing, the row-locks are sometimes carried on brackets, projecting from the sides, called outriggers (see *plate*). A racing boat, termed 'shell,' for one man may weigh only 30 lbs.

BOATBILL (*Cancroma cochlearia*): bird of the Heron (q.v.) family, the only known species of a genus differing from the true herons in little else than the form of the bill, which is comparatively short, and very broad, the mandibles resembling the bowls of two spoons placed one upon the other, the upper mandible overlapping the lower, keeled on its upper ridge, and hooked at the point. The B. is about the size of a domestic fowl, has shorter limbs than most of the herons, but resembles them in plumage, and is abundantly provided with elongated feathers on the back of the head and neck, which it erects when irritated. Its general color is rusty red, the forehead and breast whitish. It inhabits Cayenne, Surinam, Brazil, etc., sits

perched upon trees which hang over streams, and darts down upon fish, which seem its principal food.

BOAT'-FLY (*Notonecta*): genus of insects of the order *Hemiptera* (q.v.), sub-order *Heteroptera*, and of the family of the *Hydrocorisæ*, or Water-bugs (q.v.). All of them, like the rest of the family, are aquatic. Their English name is derived from their boat-like form, eminently adapted for progression in water, and probably also from their remarkable habit of always swimming on their back —peculiar to the genus *Notonecta*, as restricted by recent entomologists—and of resting in this posture suspended at the surface of the water. The known species of this genus are not numerous. One of them, *N. glauca* (sometimes called the *Water Boatman*), is about half an inch long, and varies considerably in color; but exhibits a general greenish tinge, the other colors being black, brown, and gray. They fly well, but seldom use their wings. They move with difficulty on dry ground. When they descend into the water, they carry down a supply of air for respiration in a hollow between their folded wings. They feed on animal substances, and often kill and devour their own species. *N. undulata* is very common in the United States.

BOATING: art or business of managing and propelling a boat by hand-power, or sails, or steam: for the last two see YACHT: STEAM-NAVIGATION. The coracle (see BOAT), is managed with a single paddle. The row-boat is moved by oars in pairs; when there is but one oarsman he works an oar in each hand. The rower sits usually with his back to the bow, so that his progress is backward. Sometimes, in deeper boats, the rower stands in the bottom, facing the bow, and operates one or two oars. When several rowers propel a boat, each one may have a pair of oars or only a single oar. There is an advantage in having the same number of oars on each side; but this is often dispensed with—an excess of one oar not being objected to. The steering, if executed by the rowers, is effected by their 'pulling' harder on one side than on the other, or by one side ceasing rowing. The rower nearest the bow is supposed to direct the steering. Often a regular rudder or steering oar projecting over the stern is used, when the rowers simply propel, without steering, the boat. In backing water, the motion of the oars is reversed, so as to send the boat stern forward. Another way of propelling a boat is by sculling. An oar is thrust out over the stern and worked somewhat like the tail of a fish. Being moved to and fro across the path or wake of the boat, and its blade being inclined, it acts somewhat like a screw-propeller. The Venetian gondola is propelled by one oar, with a sort of compromise between rowing and sculling. Boats are propelled sometimes by long poles: these are put down to the bottom, and the boatman pushes the boat along as far as he can, and then recovers his pole and starts anew for a second push. He may in doing this walk the entire length of the boat, back and

forth, as he pushes and recovers. The English term this 'punting': it is a favorite form of pleasure boating on the upper reaches of the Thames. Sails are often used on row-boats. As a shallow round-bottomed boat cannot go to windward, it is usual to employ a flat-board projecting down from the lee beam (a lee-board) to prevent drifting or making lee-way; or the boat may be fitted with a centreboard for the same purpose. For row-boats and canoes, special folding centreboards are made which dispense with the cumbersome trunk of the old-fashioned centreboard. Instead of either of these, a piece of board is sometimes permanently fixed to the keel, projecting downward six inches or more: it is termed a rocker.

In racing boats propelled by oars the use of the sliding seat is now universal. This is a board free to move back and forth on rollers. The rower sits on this, and as he pulls, pushes it toward the bow, and as he recovers, draws it sternward again: this adds to the power of his stroke. The motion of the sliding seat is effected by the legs, the feet being strapped to a foot-board. This gives the legs more work to do than they have in ordinary rowing.—For Boat-racing in this country and in England, see ROWING.

BOAT-LOWERING APPARATUS: frames, ropes, and pulleys for lowering boats from ships quickly and safely, in emergency. Every passenger-ship is compelled by law to carry a certain number of boats, depending on the tonnage; and every ship of war necessarily carries boats (see BOAT) for minor services. In lowering boats from a ship in a sea-way, the use of ordinary tackle is attended with inconvenience and danger. It consisted in the use of a block and fall at each end of the boat, by which it was suspended from curved arms termed *davits*. It was lowered to the water by these, which were then unhooked. If there were waves, a failure to detach both tackles simultaneously often resulted in raising one end of the boat high out of the water, and perhaps capsizing it. Exact simultaneousness is always requisite in operating the two-end tackles in order to keep the boat level. In Clifford's apparatus, a drum or windlass is fixed in the centre of the boat. Both of the end suspension ropes are carried to this drum, and by allowing it to turn the boat can be lowered horizontally. One man at the centre thwart regulates the descent of the boat by what is termed a winding rope; and soon as the boat has been lowered, the ropes are cast off from the drum. The lowering pendants are brought by blocks to the roller. Slings or lifts hold the boat steady; the lanyard is slipped off the hooks when the boat is to be lowered. The boat, filled with her crew, can be lowered by a single man.

Other lowering apparatus takes the form of swinging davits which, counterpoised by springs or weights, swing out from the ship's side while they lower the boat.

BOATSWAIN, n. *bōt'swān* or *bō'sn* [AS. *batswan*—from *bát*, a boat; *swán*, a rustic, a servant (see SWAIN)]: a ship's officer who has charge of the boats, sails, etc., and calls the crew to duty.

BOATSWAIN: an officer on board a ship, who has charge of the boats, sails, rigging, cables, anchors, flags, and cordage. He is immediately under the master in some of these duties, he frequently examines the masts and yards, sails and ropes, to report on their condition and efficiency. He also keeps account of all the spare rigging, etc., and superintends the replacement of old by new. The B. has certain duties in connection with the crew; he calls them to duty, and assists in the necessary business of the ship, and in relieving the watch. In bad weather, he looks well to the boats and anchors, especially when night is coming on.

The *boatswain's mate* assists in all the above-named duties.

BOB, n. *bŏb* [Gael. *babag*, a tassel: W. *bagad*, a cluster: Ger. *beben*, to shake]: any small thing playing loosely at the end of a string; the float of a fishing-line which *pops* up and down; a knot of worms on a string used in fishing for eels; a blow; in *bell-ringing*, a peal of several sets of changes, as a 'bob-major' or a 'bob-minor': V. to play loosely against anything; to mock; to dangle; to dance up and down; to fish with a bob for eels; in *OE.*, to flap; to gain by fraud; to deceive. Bob'bing, imp.: Adj. hanging as a bob; swinging backward and forward with a small weight at the end. Bobbed, pp. *bŏbd*. Bobbin, n. *bŏb'-bĭn*, [F. *bobine*, a pin for wrapping silk or thread round]: a round pin with a head on which silk or thread is wound; a little knob hanging by a piece of thread, used in lace-making. Bobbinet, n. *bŏb'bĭ-nĕt'*, a kind of lace wrought in machines. Bob-cherry, n. a game among children in which a cherry is so hung as to bob against the mouth. The little player tries by jumping up to seize it with the teeth, without using the hands. Bobstay, n. *bŏb'stā*, a rope used to confine the bowsprit to the stem. Bobtail, n. *bŏb'tāl*, a tail cut short; the rabble, in contempt—as *tag-rag and bobtail*. Bob'tailed, a. having the tail cut short. Bob'wig, n. a short wig.

BOBBERY, n. *bob'bĕr-i*, a squabble. Colloquial.

BOB-WHITE, n. *bob'hwīte*. The quail of North America.

BOBBINET', or Bob'bin-net: a kind of net-fabric usually made of cotton-thread. It is of the nature of lace, but is made in the lace-frame instead of by hand. The texture consists in the interlacing of a set of long threads, representing the warp in common weaving, with a set of cross-ones (the weft), in such a manner as to form a mesh-texture. The chief seat of B. manufacture in Britain is Nottingham. See Lace Manufacture.

BOB'BINS: a reel or other similar contrivance for holding thread. The bobbin, called in Scotland pirn, for delivering the weft from the shuttle, is simply a tapered pin, bored it may be throughout, with but the rudiments of a flange at the thick end; and the bobbin used for a similar purpose in lace-weaving is merely a thin metal pulley, about the size of a halfpenny. For the machines

used in the various spinning processes of the textile industries—namely, the slubbing, the roving, the drawing, and spinning frames, bobbins of various sizes, and in enormous numbers, are required. Some of these are 15 inches long by 5 inches in diameter, and diminish in size for each succeeding process, those for the spun yarn being scarcely larger than the ordinary spool for sewing-thread. There are also winding and warping bobbins for the weaving processes. For some purposes paper tubes have of late years superseded bobbins. The term bobbin is also applied to the small metal reel carrying the thread within the shuttle of a sewing machine. These vary in shape and size in different machines. In England the term is used for sewing-thread spools.

BOBBIN-WORK, n.: work woven with bobbins.

BOBBIO, *bŏb'bē-ō:* town in n. Italy, province of Pavia, near the left flank of the Trebbia, about 37 m. n.e. of Genoa. B. is an ancient place, having originated from a church and convent erected here in the end of the 6th, or beginning of the 7th c., in the crypt of which St. Columbanus and some of his disciples were buried. B. has a cathedral, an episcopal palace, and a palace belonging to the Malaspina family. It is guarded from the inundations of the Pellice by a long embankment, built by a money-grant from Oliver Cromwell, during whose protectorate the town was nearly destroyed by an inundation. Pop. abt. 4,000.

BÖBLINGER, *böb'lĭng-ẽr,* MATTHIAS: architect: d. 1505; b. Altbach, near Esslingen, Würtemburg. He was employed on the minster at Ulm 1474, and became architect of that structure 1480. He went to Frankfort 1483, whither he was invited to direct the work on the cathedral tower. When (1492) the tower of the Ulm minster, after it had been carried to the height of 237 ft., threatened to fall, B. fled from the indignant people. He went to Esslingen 1496.

BOB'OLINK, or BO'BLINK, or REED BIRD, or RICE BIRD (*Dolichonyx oryzivorus*): bird with bill like the buntings and sparrows, but of a genus characterized by stiff-pointed tail-feathers. It is rather larger than a yellow-hammer; and the male in his summer or nuptial plumage exhibits a fine contrast of colors, black, yellow, and white. The female differs greatly from the male in colors of plumage, yellowish-brown chiefly prevailing; and in the latter part of summer, the males assume the comparatively dull hues of the females. It is distinguished from the blackbirds and other orioles by its pointed tail-feathers, long middle toe, and variegated plumage. The male has two distinct sets of plumage, a summer or breeding dress, and a winter one. The former dress is lustrous black, with the neck, scapulars, rump, and upper tail coverts buff, inclining to ochraceous on the neck, and ashy on the tail; the latter is similar to that of the female, who is protectively clothed in much-streaked yellowish-brown neutral tints; the young of both sexes also resemble

her, until the young males reach maturity. The gay summer dress of the male, especially the black part, is due to the black margins upon the feathers that come in with the spring renewal of plumage. These edges wear away, and thus, as the season advances, the brownish centres of the feathers are gradually revealed. The B. is a bird of passage, spending the winter in the West Indies. In summer it is found as far n. as the banks of the Saskatchewan, lat. 54°, but is most plentiful in the Atlantic states and other e. parts of America, where it is common in meadows and cornfields. It begins to migrate southward in August, and assembles in huge flocks in early autumn in the great wild-rice marshes that border Delaware and Chesapeake bays and their rivers, where they fatten on the wild rice, and are shot in vast numbers for market, under the name of 'reed-bird.' Later in the season these birds advance southward and assail the cultivated rice plantations, where they are known as rice-birds. It renders good service by the destruction of insects and their larvæ; but the immense flocks which congregate on their return southward in autumn commit great ravages in the rice-plantations of Carolina. At this season these birds become extremely fat, and are killed in great numbers for the table. Their flesh is delicate, and resembles that of the ortolan.

The B. generally makes its nest in a grassy meadow, an artless structure of a few dry stalks and leaves, with a lining of finer grass. It displays the same instinct with many other birds, of seeking to lead intruders away from its nest, by pretending great anxiety about some other part of the field. During the breeding-season, the males are very musical, singing mostly in the air, in which they seem to rise and fall in successive jerks. Their song is very pleasing, and is 'emitted with a volubility bordering on the burlesque.' On account of their beauty and powers of song, many are caught, caged, and sold in the New York and other markets.

BOBRUÏSK, *bo-brô-isk'*, fortified town of Russia, in the govt. of Minsk; 88 m. s.e. of the city of Minsk. It is on the right bank of the Beresina, and is a station for the steam-packets navigating the Dnieper and Beresina. It was besieged ineffectually by the French, 1812. Pop. 26,000.

BOCA, *bo'kâ* [Span. meaning *mouth*]: term applied to the entrance of various straits and rivers, chiefly in America.—1. B. *Chica*, the channel of 28 m. in length, which leads to Cartagena in New Granada.—2. B. *de Navios*, the largest and most southerly outlet of the Orinoco.—3. B. *Grande*, bay of the Carribbean Sea, at the mouth of the Zucar, in Costa Rica.—4. B. *del Toro*, on the Caribbean Sea, in Costa Rica, lat. 9° 20′ n., long. 82° w.

BOCARDO, or Bokardo, n. *bō-căr'-dō* (a word without etymological meaning, but designed to have its letters symbolic): in logic the fifth mode of the third figure of syllogisms. See Syllogism and Mood in Logic.

BOCASINE, n. *bŏk'a sĭn* [F. *boucassin*]: a kind of calamanco or woolen stuff; a fine buckram.

BOCCACCIO, *bo-kât'cho*, GIOVANNI: 1313–1375, Dec. 21; b. Paris: author of the *Decamerone*. He styled himself *Da Certaldo*, and was sometimes named *Il Certaldese* by others, because his family sprang from Certaldo, a village in the Florentine territory. From an early period he showed a taste for poetry, which his father attempted to thwart; but as soon as B. had attained his majority he began poetizing both in Italian and in Latin, but not with any 'fine issues.' In prose he succeeded far better, developing quickly that airy grace of style which suits so admirably his light and lively tales, and which soon placed him in the highest rank of Italian prose-writers. He studied Dante closely, but did not confine himself to literature properly so called. In 1350, B. formed an intimate friendship with Petrarch, and, following his friend's example, collected many books and copied rare MSS., which he could not afford to buy. It is said that he was the first Italian who ever procured from Greece a copy of the *Iliad* and the *Odyssey*. He also wrote a *Genealogy of the Gods*, in 15 books, unquestionably the most comprehensive mythological work that Europe had as yet seen. But not only was B. one of the most learned men of his time, he was also one of the most enlightened in his scholarship. He helped to give a freer direction and a greater expansiveness to knowledge, stimulated his contemporaries to the study of Greek, and wished to substitute the wisdom of antiquity for the unprofitable scholasticism that prevailed.

While in Naples (1341), B. fell passionately in love with a young lady who was generally supposed to be an illegitimate daughter of King Robert. His passion was returned, and to gratify his mistress, B. wrote *Il Filicopo*, a prose-romance, and afterward *La Teseide*, the first attempt at romantic epic poetry, and written in *ottava rima*, of which B. may be considered the inventor. In 1342, he returned to Florence, but in 1344 went back to Naples where he wrote his *Amorosa Fiammetta*, *Il Filostrato*, and *L'Amorosa Visione*. Here also he composed his famous *Decamerone*, to please Joanna, the daughter and successor of King Robert. It consists of 100 stories, ten of which are told each day by seven ladies and three gentlemen, who had fled from Florence during the frightful plague of 1348, to a country villa, and who try to banish fear by abandoning every moment to delicious gayety. It is impossible to exaggerate the literary merits of the book. In abundance of incident especially, it is almost inexhaustible, though many of the stories are taken from older collections of *Contes et Fabliaux*. It is, however, unfortunately steeped in impurity. B. once more returned to Florence about 1350. He was now honored with several diplomatic appointments by his fellow-citizens, and subsequently even thought of entering into holy orders as a penance for the immoral life he had previously led. From this artificial course of repentance he was wisely dissuaded by Petrarch, who advised him to be

content with changing his conduct. In 1373, B. was appointed Dantean prof. at Florence; that is to say, he was to deliver elucidatory lectures on the *Divina Commedia* of the great poet, and zealously devoted himself to the difficult task thus imposed on him; but his health failing, he resigned the office, and retired to his little property at Certaldo, where he died, 16 months after his friend Petrarch. Besides the works above mentioned, B. wrote *Origine, Vita e Costumi di Dante Alighieri,* and *Commento sopra la Commedia di Dante.* This commentary on the Divine Comedy extends only to the 17th canto of the *Inferno.* In Latin, B. wrote, besides the *Genealogia Deorum,* a work arranged in alphabetical order, *De Montibus, Silvis, Fontibus, Lacubus, Fluminibus,* etc.; *De Casibus Virorum et Fœminarum Illustrium; De Claris Mulieribus,* etc.

BOCCA, n. *bŏk'ka* [It.]: the round hole in a glass-furnace from which the glass is taken out on the end of the pontil.

BOCCAGE, *bo-kazh',* Marie Anne Fiquet du: 1710, Oct. 22—1802, Aug. 8; b. Rouen, France: French poetess. She received her education in the monastery of the Assumption of Paris, where her poetic tendencies early developed themselves, though only furtively. She appeared as an authoress first in a small volume of poems, 1746; next as an imitator of Milton in her *Paradis Terrestre* (1748); and in 1756, issued her most important work, *La Colombiade.* The letters which she addressed to her sister, Madame Duperron, while travelling through England, Holland, and Italy, are the most interesting things which have fallen from her pen. During her life, she was excessively admired and bepraised, especially by Voltaire, Fontenelle, and Clairaut. She used to be described as *Formâ Venus, arte Minerva.* The complimentary poems addressed to her would, if collected, fill many volumes. She was elected member of the academies of Rome, Bologna, Padua, Lyon, and Rouen. Her poems fail to account for her former reputation, and indicate that her personal attractions must have given a charm to her verses.

BOCCA TIGRIS, *bok'kä tē'gris,* or Bogue: name of that portion of the estuary of the Canton river (q.v.) extending n. from lat. 22° 45′ n.; s. of this point, the estuary is designated the 'Outer Waters.' In the centre of the B. T. are the rocky islands of North and South Wantung, while on the east the B. T. has the islands of Anunghoy and Chuenpee, and on the west the Ty-cock-tow island. On these islands are the Bogue forts, which have been more than once captured by the British. The last time they were taken was 1856, Nov., the occasion of quarrel being the refusal of the Chinese to make proper reparation for the capture of a vessel under British protection, but alleged by the Chinese to be nothing but a smuggling craft, contriving to hide its real character by hoisting the British flag.

BOCHART, *bo-shâr',* Samuel: 1599–1667; b. Rouen, France, of an ancient family: Protestant divine. He very early showed remarkable talent, chiefly philological.

After studying at Paris, Sedan, and Saumur, visiting England, 1621, and finishing his education at Leyden, he was chosen pastor of the Protestant church at Caen, where he became very popular. In 1629, he gained great reputation by his victory, in a public discussion of several days' duration, over the famous Jesuit, Doctor Verin. The meetings gained additional éclat from the occasional presence of the Viceroy of Normandy, the Duke of Longueville. In 1646, appeared his Sacred Geography, bearing the title of *Phaleg* and *Canaan*. His *Hierozoicon*, or Scripture Zoology, to which he devoted many years of his life, appeared posthumously, 1675. In 1652, B. was invited to Stockholm by Queen Christina, and went thither accompanied by his friend Huet. The court-life, however, did not suit him, and his visit was short. He died suddenly while speaking at a meeting of the Caen Acad. of Antiquaries. A complete edition of his works, with a life by Morin, was published at Leyden, 1712; and a new improved edition of the *Hierozoicon*, his most valuable work, at Leipsic, in 3 vols. 4to (1793–96), by Rosenmüller.

BOCHNIA, *bok'ne-â:* town of Austrian Galicia, cap. of a circle of the same name; about 25 m. e.s.e. of Cracow. The houses are built chiefly of wood. There are extensive mines of rock-salt in its vicinity, which employ upward of 500 miners, and yield annually about 15,000 tons of salt. Pop. about 9,000.

BOCHUM, *bŏch'ôm:* town of Prussia, 35 m. n.e. from Düsseldorf by rail. Its great steel works employ over 5,000 hands and produce about 150,000 tons annually; armour-plating for ships, steel ropes and cables, machinery, safety-lamps, coal-tar, oil, and carpets are its other chief manufactures. There are valuable coal mines near by. Pop. 65,000.

BOCKELET, *bŏk'ĕl-ĕt*, or BOCKEREL, *bŏk'ĕr-el*, or BOCK'ERET: a kind of long-winged hawk.

BOCKENHEIM, *bŏk'ĕn-hīm:* town of Prussia, one m. n.w. of Frankfort-on-the-Main; on the Main and Weser R. R.; connected with Frankfort also by a street railway; has Rom. Cath. and Prot. churches, hospitals, schools of various kinds and grades, and numerous thriving industries, including marble works, manufactures of pianofortes, jewelry, bronze-ware, iron-ware, agricultural machines, shoes, breweries, chemical works, and printing establishments. Pop. 20,000.

BÖCKH, *bök*, AUGUSTUS: 1785, Nov. 24—1867, Aug. 3; b. Carlsruhe: erudite classical antiquary of Germany. He entered the Univ. of Halle, 1803. The prelections of Wolf determined him to the science of philology. His first publication was *Commentatio in Platonis qui vulgo fertur Minoem* (Halle, 1806). In 1808, appeared his *Græcræ Tragœdiæ Principum, Æschyli, Sophoclis, Euripidis, num ea quæ supersunt et genuina omnia sint.* In 1809, he became ordinary prof. at the Univ. of Heidelberg; and in 1811, he was translated to the chair of rhetoric and ancient litera-

ture at Berlin, where he taught for upward of 40 years, forming many excellent scholars, and extending his reputation through all the learned circles of Europe. His conception of philology as an organically constructed whole, which aims at nothing short of an intellectual reproduction of antiquity, excited for a long time great opposition among his professional contemporaries, but it undoubtedly gave an impetus to a deeper study of the old classical world. His lectures include not merely a grammatico-historical interpretation of the ancient authors, but also archeology proper, the history of ancient literature, philosophy, politics, religion, and social life. The four great works of B. which have opened new paths in the study of antiquity are, 1st, his edition of Pindar (2 vols., Leip. 1811–22), in which the metre and rhythm of the poet, as well as his artistic skill, are investigated and discussed with profound knowledge of the subject. 2d. *The Political Economy of Athens* (2 vols., Berlin, 1817), a work which remains unsurpassed for subtle research, surprising results, and clear exposition. It treats of the prices of goods, rate of workmen's wages, rent of houses and land, and other points of commercial economy, as well as of the larger questions of the state income and expenditure. It has been translated into English by Sir George Cornewall Lewis, under the title of *The Public Economy of Athens* (Lond. 2d ed. revised 1842). 3d, *Investigations concerning the Weights, Coins, and Measures of Antiquity* (Berl. 1838). 4th, *Records of the Maritime Affairs of Attica* (Berl. 1840). The most important of his lesser works are the *Development of the Doctrines of Philolaus, the Pythagorean*, his edition of the *Antigone* of Sophocles, and a *Dissertation on the Silver Mines of Laurion in Attica*. B. has also the honor of having commenced, 1824, the great work entitled *Corpus Inscriptionum Græcarum*, published at the expense of the Royal Acad. of Berlin, afterward continued first by Franz, and then by Kirchhoff. In 1852, appeared his *Researches on the Cosmical System of Plato;* in 1855, *The Lunar Cycles of the Greeks;* and, in 1858–74, his collected minor works (7 vols.).

BOCKING, n. *bŏk'ĭng* [from *Bocking*, near Braintree, in Essex, where it was originally made]: a coarse woolen fabric.

BOCK'LAND, or BOCLAND, or BOOKLAND: one of the original modes of tenure of manor-land, also called charter-land or deed-land, which was held by a short and simple deed under certain rents and free services. It was land that had been severed by an act of government from the *Folcland* (q.v.), and converted into an estate of perpetual inheritance. It might belong to the church, to the king, or to a subject; it might be alienable and divisible at the will of the proprietor; it might be limited in its descent, without any power of alienation in the possessor. It was granted often for a single life or for more lives than one,

with remainder in perpetuity to the church. It was forfeited for various delinquencies to the state. It was the species of land tenure that gave rise to modern freeholds.

BODE, v. *bōd* [AS. *bodian*, to deliver a message with a warning or command; *bod*, a message connected with AS. *beódan*, to command: Icel. *boda*, to announce]: to portend good or bad; to foretell; to foreshadow; to be ominous. Bo'DING, imp. Bo'DED, pp. Bo'DING or BODE'MENT, n. an omen; a portent; a foreshadowing. BODE'FUL, a. ominous.

BODE, v. *bōd* [AS. *beodan*, to offer (see BID)]: in Scot., and *OE.*, to offer with importunity: N. an offer made at a sale of goods, or in making a bargain. Bo'DING, imp. BODED, pp. *bō'dĕd*.

BODE, *bō'de*, JOHANN ELERT: 1747, Jan. 19—1826, Nov. 23; b. Hamburg, where his father kept a commercial academy: German astronomer. During boyhood, from the garret of his father's house, he observed the heavens with a telescope made by himself; at the age of 18 was patronized by Prof. Büsch; calculated the solar eclipse of 1766, Aug. 5, and in 1766 pub. an account of it beforehand; pub. 1768 an elementary treatise on astronomy; in 1772, was made astronomer to the Acad. of Sciences at Berlin. In 1774, he commenced a periodical, the *Astronomical Year-Book*, still continued. His most famous work is *Uranographia*, an atlas of the heavens (1801), containing observations on 17,240 stars, or 12,000 more than previous charts. See BODE'S LAW.

BO'DEN-SEE: see CONSTANCE, LAKE OF.

BODE'S LAW: an arithmetical relation traceable between the distances of the planets from the sun. It may be thus stated: write, in the first instance, a row of fours, and under these place a geometrical series beginning with 3, and increasing by the ratio 2, putting the 3 under the second 4; and by addition we have the series 4, 7, 10, etc., which gives nearly the relative distances of the planets from the sun.

4	4	4	4	4	4	4	4	4
	3	6	12	24	48	96	192	384
4	7	10	16	28	52	100	196	388

Thus, if 10 be taken as the distance of the earth from the sun, 4 will give that of Mercury, 7 that of Venus, and so forth. The actual relative distances are as follows, making 10 the distance of the earth:

Mercury.	Venus.	Earth.	Mars.	Asteroids.	Jupiter.	Saturn.	Uranus.	Neptune.
3·9	7·2	10	15·2	27·4	52.9	95.4	192	300

No physical reason has been given to account for the correspondence so far as it is traceable between the law and the actual distances. B. L., therefore, in the present state of science, is termed empirical. Kepler was the first to perceive the law; he was followed by Titius, of Wittenberg; and Bode argued from it that a planet might be found between Mars and Jupiter, to fill up the gap that

existed at the time in the series. The discovery of the Planetoids (q.v.) proves the correctness of this prediction. The greatest deviation from the law is seen in the case of Neptune; but if we were acquainted with the principles from which the law proceeds, we might also be able to account for the discrepancy. Similar relations, though expressed in different numbers, are found in the distances of the satellites of Jupiter and Saturn from their primaries.

BODGE, v. *bŏj* [Ger. *patsche*, a puddle, mud]: in *OE.*, to make bad work; to fail; to stop: see BOTCH.

BODICE, n. *bŏd'ĭs* [formerly *bodies*—from fitting closely to the body]: a quilted waistcoat worn by females; stays.

BODKIN, n. *bŏd'kĭn* [Gael. *biodachan*, a shoemaker's awl: Bohem. *bod*, a prick or stitch; *bodak*, a prickle or point]: a small spear-like instrument for fastening up the hair behind, much used by the women of antiquity; a sharp pointed instrument for piercing holes in cloth; anciently a common name for a dagger; a large blunt needle for drawing thread or tape through hemmed spaces.

BODLE, n. *bōd'l:* an old Scotch coin, value about the third part of a halfpenny. According to Jamieson, it was said to have been named from a mint-master whose name was *Bothwell.*

BODLEIAN or BODLEYAN LIBRARY, *bŏd'lĕ-ăn:* the public library of Oxford Univ., restored by Sir Thomas Bodley (q.v.) 1598, his first act being the presentation of a large collection of valuable books, purchased on the continent at an expense of £10,000. Through his influence and noble example, the library was speedily enriched by numerous other important contributions. Among the earliest subsequent benefactors of the B. L., which was opened 1603, with a well assorted collection of about 3,000 vols., were the Earl of Pembroke, who presented it with 250 vols. of valuable Greek MSS.; Sir Thomas Roe; Sir Kenelm Digby; and Abp. Laud, who made it a magnificent donation of 1,300 MSS. in more than 20 different languages. Upward of 8,000 vols. of the library of the famous John Selden (q.v.) went to the Bodleian Library. General Fairfax presented the library with many MSS., among which was Roger Dodsworth's collection of 160 vols. on English history. During the present century, the most important bequests have been the collections of Richard Gough on British Topography and Saxon and Northern literature, of Clarke, the traveler, including some rare Greek and Latin MSS., and of Francis Douce, the Shakespearean commentator. By purchase, the library acquired some magnificent collections of Oriental. Greek, Latin, and Hebrew books and MSS. The B. L. is particularly rich in biblical codices, rabbinical literature, and materials for British history. By the copyright act, it is entitled to a copy of every book printed in the United Kingdom. The number of volumes is estimated at about 500,000 in addition to 20,000 to 30,000 in manuscript.

The first catalogue of the printed books was published by the first librarian, Dr. James, 1605. By statutes drawn up for the government of the library by Sir Thomas Bodley, it was decreed that the vice-chancellor, the proctors, and the regius professors of divinity, law, medicine, Hebrew, and Greek, should be visitors and curators; a statute passed 1856 added 'five more residents to be elected by congregation for ten years, if continuing to reside, and to be re-eligible.' Members of the univ. who have taken a degree are admitted to the use of the library—a small addition on the matriculation fees, and an annual payment, being charged for the privilege. Literary men, properly recommended, are allowed to make extracts from the works in the library, which is open between Lady-day and Michaelmas from 9 A.M. till 4 P.M., and during the other half of the year from 10 to 3. It is shut during certain holidays, and for visitation purposes, in the aggregate, about 34 days in the year, besides Sundays. Since 1861 the domed Radcliffe Library (now *Camera Bodleiana*) has served as a reading-room, open all the year from 10 A.M. to 10 P.M. This renowned library, in fine, is rich in many departments in which other libraries are deficient, and forms altogether the noblest collection of which any university can boast. It is constantly increasing by donations, by copies of every work printed in the United Kingdom, as well as by books purchased from the fund left by Bodley, by fees received at matriculation, and by an annual payment of all persons (servitors excepted) who have the right of admission to the library.

BOD'LEY, SIR THOMAS: 1545, March 2—1613, Jan. 28; b. Exeter, Eng.: restorer of the library originally established at Oxford by Humphrey, Duke of Gloucester. His family being forced to flee from England during the persecutions of Mary, settled at Geneva, where B. studied languages and divinity under the most distinguished professors of that city. On the accession of Elizabeth, he returned to England, and completed his studies at Oxford, where he took the degree of M.A., and was afterward elected a proctor. After travelling some time abroad, he was employed by the queen in diplomatic missions to Denmark, France, and Holland, and returned to his favorite city, Oxford, 1597, where he applied himself to literature, especially to the extension of the univ. library, now called the BODLEIAN (q.v.), in B.'s honor. In collecting rare and valuable books from many parts of Europe, B. expended a very large sum, and also left an estate for salaries to officers, repair of the library, and purchase of books. He also erected an additional structure for the reception of the increasing quantity of valuable books and manuscripts. He was knighted by King James, and died at Oxford. B.'s autobiography, extending to 1609, with a collection of his letters, has been published under the title *Reliquiæ Bodleianæ* (Lond. 1703).

BODMANN, *bod'mân* (ancient *Bodami Castrum*): village of Baden, at the mouth of the Stockach, on Lake Con-

stance, with ruins of a castle, formerly the residence of the lieutenants (*Botemann* or *Bodmanno*, messenger or *legatus*) of the Carlovingian kings; hence the German name of the lake, Bodman-n-see, or Boden-see. Pop. 900.

BOD'MER, JOHANN JAKOB: 1698, July 19—1783, Jan. 2; b. Greifensee, near Zurich. The study of the Greek and Latin writers, with the English, French, and Italian masters, having convinced him of the poverty and tastelessness of existing German literature, he resolved to attempt a reformation. Accordingly, in 1721, with a few other young scholars, he commenced a critical periodical, entitled *Diskurse der Maler*, in which the living poets were sharply handled. After 1740, when B. published a treatise on *The Wonderful in Poetry*, a literary war broke out between him and Gottsched, long waged with great bitterness; yet it partly prepared the way for the Augustan epoch of German literature. B. died at Zurich, in the univ. of which he had held the chair of history for 50 years. As an author, he was marked by inexhaustible activity, but his poems, dramas, and translations have no vigor or originality. His best known production is the *Noachide* (Zurich, 1752). He did greater service to literature by republishing the old German poets, the Minnesingers, and a part of the *Nibelungen*, as also by his numerous critical writings.

BOD'MIN: county town of Cornwall, Eng., in the middle of the county, 26 m. n.n.w. of Plymouth. It is partly in a valley and partly on the side of a hill, and consists principally of one street a mile long. Its chief trade is in cattle and sheep. Among the more important recent buildings are a market house, the county jail, and the new Cornwall lunatic asylum. B. arose in a priory founded in the 10th c., and was long an important place, having, besides the priory, a cathedral and 13 churches. The priory was once the property of Thomas Sternhold, one of the translators of the Psalms of David into English metre. 1,500 persons in B. are said to have died of the pestilence in 1351. Pop. 5,500.

BODONI, *bo-do'nē*, GIAMBATTISTA: 1740–1813; b. Saluzzo, Sardinia: type cutter and printer. He went to Rome, 1758, where he secured an engagement as compositor in the printing-office of the Propaganda, and remained till the death of his patron, Abbate Ruggieri, 1762 or 1766. In 1768, he went to Parma, where he published several specimens of his workmanship; among others—on occasion of the marriage of the Prince of Piedmont with the Princess Clotilde of France—the *Epithalamia Exoticis Linguibus Reddita*, which exhibited the alphabets of 25 languages. In 1789 the Duke of Parma made him supt. of his private printing establishment, and from this press he sent forth his edition of the *Iliad* (3 vols. 1808), dedicated to Napoleon. It is a splendid specimen of typography; but the correctness of the text is not equal to the beauty of the printing. His editions of Virgil (2 vols. 1793) and several Greek, Latin, Italian, and French classics, as also his

Lord's Prayer in 155 languages, are admired for their elegance. He died at Parma.

BODY, n. *bŏd'ĭ* [AS. *bodig;* Gael. *bodhag*, a human body: *bod.*, to exist: Sks. *banha*, the body: the frame of an animal; a mass of living or dead matter; the main part or bulk; an individual or single person, as *no body;* a substance, as opposed to spirit; a collection of individuals; strength or quality of a material; a system or collection, as body of laws: V. to produce in some form. BOD'IED, a. *-ĭd*, containing a body; having a material form. BOD'ILY, a. *-ĭ-lĭ*, denoting body as opposed to mind; corporeal; real: AD. corporeally; entirely. BOD'ILESS, a. having no body. BODY POLITIC, a state in its national or political capacity. BODY-GUARD, a select body of troops who attend on a sovereign for his protection. LIFE-GUARD, G. *leibgard*, is the same as B.-G. BODY-SNATCHER, one who snatches or steals a body from a graveyard for the purpose of dissecting it or selling to those who will do so.

BODY, THE HUMAN.—The entire physical organism of man consists of a trunk, head, neck, and four extremities or limbs. Its general figure and stability are maintained by the bones, some 200 in number, which, associated with cartilages and ligaments, form the bony framework or skeleton.

Skin, fat, connective tissue and muscles, of various shapes, overlie the skeleton. It (either by its bones alone or aided by muscles and other tissues) encloses four principal cavities. The first, the cranial cavity, contains the brain and the beginning of the spinal cord, also nerves and blood-vessels, and shelters the eyes and apparatus of hearing, smell and taste.

The second, or thoracic, extends from the base of the neck downward to the diaphragm and from the spinal column and ribs behind to the breast bone and cartilages of the ribs in front. It contains the heart, lungs, some large blood-vessels, lymphatics, nerves, the thoracic duct and the œsophagus or gullet.

The third, or pelvic, enclosed by the hip bones upon the sides, the pubic bone in front, and the lower end of the spinal column behind, contains the bladder, the rectum, and part of the generative organs of the male and female, besides blood-vessels, nerves, lymphatics, fat and connective tissue.

The fourth, or abdominal, between the thoracic and pelvic cavities, largely enclosed by muscular walls, contains the liver on the right side, the stomach and spleen on the left, the intestines in front, and the pancreas, kidneys, receptacle for chyle, lymphatics, very large blood-vessels and nerves, behind, in addition to fat and connective tissue and many small blood-vessels and nerves.

The Bones.—The bones of the very young contain much animal matter, and comparatively little mineral matter, hence may bend quite readily. In old age the bones have an excess of mineral matter and break easily. The strength and elasticity of the bones are maintained by

the general health of the body. In early life phosphatic and lime salts should be supplied in comparatively large amounts, by such foods as milk and cereals, else the bones may become so soft and flexible as to be distorted readily by muscular contraction or by weights which they would normally sustain. Acoholics consumed in large amounts frequently affect the bones as well as other tissues. Surgeons recognize that broken bones of drunkards unite with great difficulty. Ligaments which bind the bones together, the synovial membranes which contain the lubricating material of joints, and the cartilages which by their elasticity serve to diminish the force of shocks from jumping, etc., may become inflamed from exposure to damp and cold, from injuries or as the result of some systemic disease.

The Muscles.—Muscles, about 400 in number, are essentially organs of motion but also aid in locomotion. By them the varied movements of the body are performed and speech and expression made possible. Through their action the heart pulsates, the blood circulates, and respiration, digestion and other vital processes are carried on. They help to hold the bones together, to form the walls of the cavities of the skeleton, to shield blood-vessels, nerves and lymphatics, and to diminish the force of shocks and blows. Those muscles grouped about and attached to bones, and others connected with cartilages, ligaments, skin and other structures are called voluntary muscles, as for the most part they are governed by the will. The involuntary muscles, mostly within the skeleton, form a large part of the walls of hollow organs, as the stomach, intestines and blood-vessels. There are also mixed muscles, as those of breathing, belonging partly to the voluntary and partly to the involuntary classes.

For healthy growth and development, muscles need alternate exercise and rest, a constant supply of pure blood (largely the result of nourishing food and pure air) and sufficient nerve stimulus, otherwise, waste products accumulate and muscular activity is diminished. Certain muscles are intended to be at rest while others are in activity. Proper exercise, besides developing and strengthening the muscles, exerts pressure upon the blood-vessels and so increases the force and rapidity of the circulation, and especially if taken in the open air, promotes the consumption of oxygen and the elimination of waste products by the skin, lungs, bowels and kidneys. It develops breathing power, improves appetite and digestion, diminishes the undue accumulation of fat, increases animal heat, and strengthens the nervous system. But, exercise should be adapted to the powers of endurance of each individual and should be varied and agreeable. Printers, writers and others who mainly use one set of muscles, should from time to time use other muscles. For, overused muscles are liable to wasting and paralysis. In idle muscles, beside wasting occurring, fat may take the place of muscular tissue. Severe exercise especially of undevel-

oped muscles, sudden or great strains may cause disease of the heart, blood-vessels or nerves. Exercises which bring into action nearly all the muscles of the body are swimming, horse-back riding, fencing, boxing, base ball, foot ball, lawn tennis, golf and military drill; of the upper part of the body, principally are such as bowling and shooting; of the lower part, such as walking, skating, dancing and bicycle riding. Prolonged use of alcoholics and poor food cause muscles to lose tone and become flabby. Rest, change of work, and sleep recuperate tired muscles.

Sleep.—All parts of the body require rest, and share in the benefits of sleep. Quiet sleep, undisturbed by dreams or worries, is the most refreshing. The amount of sleep needed varies with the age and condition of the individual. In infancy and old age, much is needed. In middle life about eight hours is necessary. The habit of using sleep producing medicines is dangerous. A brisk walk in the open air, a bath or some light food, agreeable conversation or reading is frequently sufficient.

Fat.—The fat of the body, constituting about one twentieth of its weight, is found in all parts of the body, with the exception of the bones, teeth and fibrous tissues, and in various forms. It acts as a cushion in various parts of the body, helps to maintain animal heat, fills up inequalities and serves for nutrition in time of need, as in torpid animals and emaciating diseases. Probably there is a normal limit to the amount of fat in each individual. An amount much above this limit is likely to be distressing and even dangerous, by impeding the action of the heart, or taking the place of other tissues, producing diseased conditions. A steady gain of fat within the normal limit shows an improved condition of blood and better nutrition, while a deficiency warns us of an impoverished blood and the approach of some debilitating disease.

Its increase is promoted by an improved digestion, the use of starchy, sugary and fatty foods, together with wholesome animal and vegetable substances: alcoholics are not advisable. It may usually be diminished by the partial or complete omission of fat, sugar, starch, and alcoholics by proper bathing, attention to the excretory organs and by systematic, well adapted exercise. Medicines powerful enough to reduce fat are dangerous.

Vital Heat.—The body must have a pervading temperature, i. e., its animal or vital heat, in order to perform efficiently its various processes. The average temperature of man in health as shown by the clinical thermometer is 98½° F., but in the interior of the body it is about 100°. Young children have a higher temperature and old people a lower.

A temperature of several degrees above the normal indicates too rapid functional activity, a temporary fever, or a severe attack of disease; of several degrees below, prostration and faulty nutrition, with very high as well

as low temperature, there is an accumulation of poisonous products. The possession of animal heat is one of the tests of life. Life has been restored by the application to the body of heat, both externally and internally, by the use of stimulants and by arousing the circulation and respiration by electricity and the practice of artificial respiration.

Heat enters the body with food, and radiation from the sun and fires, and is produced by the oxidation of the substances of the body by transformation of food, muscular action, etc. It is carried through the body by the blood and also distributed by direct conduction from one part to another. It is controlled by a nervous mechanism, and escapes from the body through the skin, lungs, bowels and kidneys either as watery vapor, or in other forms.

Exercise in the open air, proper clothing and bathing, and especially fatty articles of diet are the best methods of maintaining the vital heat. To become chilled and to stay chilled for a considerable time is always dangerous.

The Skin.—The care of the skin is of prime importance, as it has no less than six functions. It is, 1st, a protective covering to the parts beneath; 2d, an organ of sensation, being abundantly supplied with nerves; 3d, an organ of excretion sending out through the perspiration waste products; 4th, a regulator of temperature, by means of the evaporation of perspiration; 5th, an organ of absorption, taking up and passing into the lymph and blood-vessels, substances such as water, oil and certain medicaments with which it may strongly come in contact; and 6th, an accessory organ of breathing, absorbing oxygen and giving out carbon dioxide, performing from $\frac{1}{40}$th to $\frac{1}{50}$th of the respiratory functions. In addition to perspiratory glands the skin has sebaceous or oil glands, in connection with most of the hair follicles (natural hair oil) and also opening directly upon the surface of the skin, especially numerous about the nose and nape of the neck. The openings of both sets of glands are known as 'pores' and are best kept clear, and the skin in condition to carry on its functions, by proper bathing and clothing.

Baths.—While baths are classified as hot, warm, tepid, temperate, cool and cold most people use temperate or warm baths. These cleanse the skin of much impurity if soap and friction are used, but the skin is best strengthened to withstand the vicissitudes of weather by the frequent use, in a warm room of cool or even cold water sometimes following the use of warm water and always attended by brisk friction. A dirty skin not only interferes with its functions, but may be a source of contamination, especially if impaired by a skin disease.

Clothing.—Clothing, used as an ornament and to cover nakedness, should have as its principal object the preservation of normal animal heat. In hot weather, light colored and comparatively thin clothing is advisable,

so as to absorb as little heat as possible and to allow free evaporation of perspiration, and in cold weather, darker and warmer clothing especially underclothing either of wool or silk. Too much clothing retains perspiration in contact with the skin, when it sours and causes irritation. Clothing should be light, well ventilated, dry, clean and free from poisonous dyes. Dirty clothing is not only filthy but is liable to contain disease germs. Damp clothing, even shoes, may chill the body. 'Comfort rather than style' in the matter of clothing is advisable especially as to shoes.

Blood.—The blood (q. v.) is the true 'vital fluid.' Made from wholesome and sufficient food, purified by good air, and helped on its course by suitable exercise it nourishes all the tissues of the body. When it is impure or insufficient in amount it cannot maintain health. Living in the open air with suitable environments, and attention to personal hygiene, is the best means of improving the condition of the blood. Dissipation in any direction serves to impoverish it. The blood circulates through the body by the aid of the heart and blood-vessels. If these organs are over-worked or over-excited by emotion grave results may follow. In fact, temperance in all things is a good rule to follow. Associated with the blood-vessels are lymphatics, delicate vessels connected with glands, which drain out from the tissues the superabundance of nutritive material brought there by the blood, and also some waste products, and carry them into the circulation. Nearly all tissues of the body are permeated with blood-vessels and lymphatics.

Respiration.—The object of respiration is to bring oxygen in large quantity into contact with the blood, so that it may be rendered red and pure, fit to do its work. The organs of respiration are the lungs and the air passages, i. e., the interior of the nose, the mouth, pharynx, larynx, trachea, bronchi and bronchial tubes. The nose is in reality the proper channel of respiration as it is adapted to strain out hurtful particles from the breathed air. Confirmed mouth breathers have enlarged tonsils and deformed chests. Many persons have shallow respiration because they have not learned to expand most of the air cells of the lungs. Such persons generally lead sedentary lives, and are more liable than others to diseases of the lungs. Life insurance companies will not accept as risks those who make less than two inches in the expansive circumference of the chest, i. e., between the lungs filled with air (inspiration) and the lungs rid of air (expiration). There is a definite relation between circulation and respiration and animal heat. In adults there should be one act of respiration to every four or five beats of the heart, and in children one to every three or three and one-half beats. Inspired air is robbed of a large part of its oxygen which purifies the blood and expired air will not maintain life—as it is charged with carbon dioxide in excess, excretory products similar to those excreted

by the skin and kidneys and also an offensive animal product. If the temperature of the body is lowered for a length of time secretion and other processes are interfered with and finally circulation and respiration are lowered below the normal standard.

Air.—Harmful air to breathe is that which contains dust and other suspended matters, an undue proportion of one or more of its normal ingredients, poisonous gases, and especially disease germs. These last (harmful bacteria) produce dangerous communicable or infectious diseases, which may overpower the vital processes by contaminating the blood. It is very unwise to expose children to infectious diseases. Dusting and sweeping should mean the removal of dust and dirt. The temperature of cold air brought to the lungs may be mitigated and suspended matters prevented from entering the air passages by the wearing of a veil, or some contrivance designed for the purpose. Poisonous gases emanate from stoves and furnaces improperly arranged, from sewers, gas pipes, etc. Air may become 'devitalized' by mixture with emanations from decaying lumber in cellars, musty clothes stored in closets, from poisonous wall papers or decomposing paste between layers of wall paper, from decomposing food, from tobacco smoked rooms, and from decaying and vegetable material in the excavations of dwellings. Country air is pure and the best to breathe, if there are no nuisances, no decomposing garbage or stagnant water, no poor drainage, etc. Air may be purified for breathing purposes by ventilation, by chemicals, or by heat or steam. Sunlight in sufficient amount is a great invigorator.

Nutrition.—The maintenance of life, growth and development, the production and utilization of various forms of energy all depend upon the vitality of the innumerable cells of which the body is composed. This vitality is largely influenced by food. But, nutrition is a complex process. It involves the reception, digestion and absorption of food, the absorption of oxygen, the conveyance of absorbed food and oxygen to all parts of the body, the building up of tissues by assimilation, the breaking down of tissues and the taking up of waste materials thus produced and conveying them to excretory organs for expulsion from the body. All of this work is effected by cells. The body differs from a house or a machine, in that it possesses life. Its numerous cells, tissues and organs work together in health, each one doing its own specific work. Its various fluids, blood, lymph, tears, the fluids in joints and other closed cavities, for example, afford either moisture, pliability, nourishment or lubrication. The complex processes of nutrition are also aided by the inorganic and organic chemical constituents of the body—its cells and tissues, also by mechanical processes such as the grinding of food in the mouth, and the motion of the muscles of the intestines and stomach in the digestion of food.

The Functions of the Body.—These may be classified as: (1) Nutritive functions, or those concerned directly with the maintenance of the individual, such as digestion, respiration, and; (2) nervous functions, those that bring the different organs into harmonious relation with one another, and also bring the individual, through the special senses, sight, hearing, etc., into relation with the world outside him; and (3) reproductive functions which enable the individual to reproduce the species.

Digestion.—Man, being an omniverous animal, able to live on a large number of food substances, needs complicated digestive organs. They include the alimentary canal (mouth, oesophagus, stomach, large and small intestine) and the teeth, salivary glands, liver and pancreas. Digestion is readily effected by the thorough chewing of food by sound teeth and its admixture with saliva, by slow swallowing, by the chemical action of the gastric, pancreatic and intestinal juices and by the normal movements of the stomach and intestines. Indigestion is caused by a defect in any of these steps. When the food is thoroughly digested there results a creamy mass which is taken up by veins and lacteals and carried into the blood. The waste products for the most part are cast out of the body—therefore the regulation of the bowels and kidneys is of prime importance.

Food.—To make the best blood and also to keep the digestive organs in good working order, food should be varied, of good quality, in amount enough to be readily digested, and should contain water, salts, proteids, carbohydrates and fat in due proportion. No one should become a slave to appetite.

The Nervous System.—All of the functions of the body are controlled by the nervous system—the voluntary processes by the brain, spinal cord, cranial and spinal nerves and the involuntary, by the sympathetic or ganglionic system. Man's capacity for development, especially of the brain, asserts his supremacy over all other forms of creation. Nerve force, the peculiar power transmitted by nerves, manifests itself in sensory impressions, motor impulses and more or less complicated reflex actions, which last, for the most part, are performed without the knowledge of the individual, but may sometimes be voluntarily aided, such as swallowing and coughing. Certain actions which are purely voluntary may by frequent repetition become habitual—and are known as artificial reflex actions. When nerve force becomes perverted from disease, excessive introspection, worry, severe mental or physical work, unsuitable food, etc., so called nervousness or nervous prostration results. The nervous system like other parts of the body needs wholesome food and all other hygienic necessities. Mental labor in excess is exhausting. No one should work up to the full measure of his ability, and so closely are mind and body related that if the health of one fails, that of the other is likely to be impaired. Self control is the remedy to prevent nerve

tire and nervous irregularities. 'He that ruleth his own spirit is greater than he that taketh a city.'

Health—harmonious development.—Finally, all parts of the body must act together, each in its own way to produce harmony, health or wholeness. The development of one part of the body at the expense of another, produces discord and then disease. And this is a very common error. For example, one person believes that strong muscles mean health, and so overexercises and weakens the heart and nervous system, another develops his nervous system at the expense of his muscles and suffers. What we need is resisting power and that can only be secured by attention to all hygienic measures. Health brings so many charms and such great blessings it is indeed a pity that so few possess it. It means a clear skin, a bright eye, a firm step, erect carriage, graceful movements, great powers of endurance and the cheerful temper that waits on good digestion. On the contrary, disease not only causes misery, but is expensive, as it interferes with the earning capacity of the individual afflicted.

BODY-COLOR: in oil-painting, the opaque coloring produced by certain modes of combining and mixing the pigments. When, in water-color painting, pigments are laid on thickly, and mixed with white, to render them opaque, instead of in tints and washes, the works are said to be executed in body-color.

BODY OF A CHURCH: commonly called the *Nave* (q.v.), though this latter term is sometimes employed to include the Aisles (q.v.). It is sometimes familiarly though incorrectly applied to the main or middle aisle.

BOD'Y'S ISLAND: a low sand strip in Dare co., N. C., about 2 m. long; separates Roanoke and Albemarle sounds from the Atlantic; its s. end is near Oregon inlet. On the n. end is a light 150 ft. high, in 35° 48′ 47″ n., 75° 33′ 20″ w.

BODY-SNATCHING: see ANATOMY, in Law.

BOECE, or, more properly, BOYCE, *boys*, HECTOR: abt. 1465–1536; b. Dundee, of an old family: distinguished Scottish historian. He completed his education at Montague College, in the Univ. of Paris, and, 1497, was appointed prof. of philosophy. Among other learned men whose friendship he here acquired was Erasmus. About the beginning of the 16th c., he was invited by Bp. Elphinstone to preside over the univ. newly founded by him at Aberdeen. B. accepted the office after some natural hesitation, the yearly salary being 40 merks, or about £2. 4*s*. 6*d*. sterling. The value of money, however, it has to be remembered, was immensely greater then than now, and the learned principal was at the same made a canon of the cathedral, and chaplain of St. Ninian. There is every reason to suppose that he discharged his duties with high success. In 1522, he published his lives, in Latin, of the Bishops of Mortlach and Aberdeen. This work, a great part of which is occupied with the life of his excellent patron, Bp. Elphinstone, was reprinted by the Bannatyne

Club, 1825. In 1527, B. published the Latin *History of Scotland*, on which his fame chiefly rests, a work which, though proved to contain a large amount of fiction, is worthy of the commendation it has received even on the score of style. The author was rewarded by the king with a pension of £50 Scots, until he should be promoted to a benefice of 100 merks, which appears to have occurred 1534. See BELLENDEN, JOHN.

BOEHM, *böm*, Sir JOSEPH EDGAR, Bart., R.A.: sculptor: 1834, July 6—1890, Dec. 12; b. Vienna, of Hungarian parents. He was educated at Vienna, and 1848–51 in England; he studied in Italy also, and for 3 yrs. in Paris. He made his home in England 1862, and resided there till his death. B. received the first imperial prize at Vienna 1856; was elected member of the Acad. of Florence 1875, associate of the London Royal Acad. 1878, royal academician 1882; created baronet 1883. Among his very numerous works are: a colossal statue in marble of Queen Victoria, 1869; colossal statue of John Bunyan, 1872; colossal equestrian statue of the Prince of Wales, 1877; statue of Thomas Carlyle; horse group in bronze for Eton; colossal equestrian statues of the great Duke of Wellington, of Lord Napier of Magdala, and of Lord Northbrook; statue of King Leopold I. of Belgium; recumbent statues of Gen. (Chinese) Gordon and of many church dignitaries. At the Royal Exhibition, 1889, B. exhibited *The British Guardsman of* 1818 and *The Inniskillen Dragoon of* 1815. Notable among his works are a life-size bull, with his leader, in marble, and a large equestrian bronze group of *St. George and the Dragon;* several racehorses; a colossal lion and lioness; a sea-lion in black marble, etc. He executed busts of Gladstone, John Bright, John Ruskin, etc., and designed the effigy of Queen Victoria for the coinage commemorative of the 50th year of her reign.

BŒHME′RIA: genus of plants of the nat. ord. *Urticaceæ*, included, until recently, in the genus *Urtica* or Nettle (q.v.). The fibres of a number of species are used for making ropes, twine, nets, sewing-thread, and cloth; and some of them appear likely to acquire much economical and commercial importance. *B. nivea* (formerly, *Urtica nivea*) has been recently ascertained to yield great part of the fibre employed in China in the manufacture of the beautiful fabric known as *China-grass* (q.v.) cloth. It is a perennial herbaceous plant, with broad ovate leaves, which are white and downy beneath, and is destitute of the stinging powers of the nettles. It is carefully cultivated by the Chinese, by whom it is called *Tchou Ma*. It grows naturally, and is also cultivated in Sumatra, Siam, Burmah, Assam, and other parts of the East. The fibre is called *Caloee* in Sumatra, *Ramie* by the Malays, and *Rheea* in Assam. Recently, this plant, under its Malay name *Ramie* (q.v.) has been introduced into cultivation in Cal. and some of the southern states, with moderately encour-

aging results as to production of fibre.—*B. candicans* and *B. utilis*, from which a fine silky fibre is obtained in Java, are either varieties of this or nearly allied species.—*B. fruiescens* is another important species, common in Nepaul, Sikkim, and other parts of the Himalaya, to an elevation of 3,000 ft. above the sea. It is not cultivated, but often overruns abandoned fields. It grows to a height of 6 or 8 ft. and varies from the thickness of a quill to that of the thumb. The leaves are serrated, dark-green above, silvery-white below, not stinging. The plant is cut down for use when the seed is formed; the bark is then peeled off, dried in the sun for a few days, boiled with wood-ashes for four or five hours, and beaten with a mallet to separate the fibres, which are called *Pooah* or *Poee*, and also *Kienki* or *Yenki*. When properly prepared, the fibre is quite equal to the best European flax.—The fibres of a number of coarser species are employed in different parts of the East Indies for making ropes.

BŒOTIA, *be-ō'she-a:* one of the ancient political divisions of Greece; bounded on the n. and n.w. by Locris and Phocis, on the e. by the Eubœan Channel, on the s. by Attica and Megaris, and on the w. by the Corinthian Gulf. B. had a surface estimated at 1,120 sq. m. The plains enclosed on the s. by Mounts Cithæron and Parnes, on the w. by Mount Helicon, on the n. by the slopes of Mount Parnassus and the Opuntian Mountains, fall naturally into three divisions—the basin of the lake Copais, now called Topolias, that of the Asopus, and the coast-district on the Crissæan Sea. The principal stream was anciently called the Cephissus. It entered the country from Phocis at Chæronea; and in the spring, when it was swollen by innumerable torrents, almost converted the Copaic plain into a lake. There were several natural channels for the outlet of the waters that congregated in this plain, but they were not sufficient to carry off the surplus, and the surrounding country was in consequence frequently deluged. In order to guard against this inundation, two tunnels had been cut in the rock for the discharge of the water. One of these tunnels, which carried the water to upper Larymna—where it emerged in a natural outlet after a subterraneous course of nearly 4 m., whence it flowed above ground a mile and a half to the sea—was no less than 4 m. in length, with about twenty vertical shafts let down into it, some of which were from 100 to 150 ft. deep. The other tunnel, which united the Copais Lake with that of Hylica, was much shorter, but still an extensive work. The date of these gigantic engineering undertakings is not precisely known, but they are generally attributed to the Minyæ of Orchomenus. B. was in ancient times very productive of marble, potter's earth, and iron, besides abounding in corn and fruits; and it was also particularly celebrated for flute-reeds. The earliest inhabitants belonged to different races, the two most powerful of which were the Minyæ and Cadmeans or Cadmeones; but were at an early date (about 60 years

after the Trojan war, according to Thucydides) in part dislodged by the Bœotians, an Æolian people who were driven from Thessaly, and in part incorporated with them. The Bœotians excelled as cultivators of the soil, and were gallant soldiers both on foot and horseback; but they were rude, unsociable, and took no part in the gradual refinement of manners and intellectual development of the rest of Greece, so that the name became proverbial of illiterate dulness. This was usually ascribed to their thick damp atmosphere. Yet there have not been wanting among them eminent generals, as Epaminondas; and poets and historians as Hesiod, Pindar, Corinna, Plutarch, etc. The greater cities, of which the number was about 14, Thebes, Haliartus, Thespiæ, etc., with their territories, formed the Bœotian League. At the head of this was an archon, and next to him a council, composed of four persons, having its headquarters in Thebes. The executive authority was intrusted to Bœotarchs, elected in popular assemblies of the separate states, and holding office only one year. Of this league, a shadow remained down to the times of the empire; but after the battle of Chaeronea, in which Philip established the Macedonian throne on the ruins of Grecian liberty, the political importance of the country declined so rapidly, that about B.C. 30, only two cities, Tanagra and Thespiæ, were of any consideration. —With Attica, B. now forms one of the 'nomarchies' of the kingdom of Greece.

BŒOTIAN, a. *be-ō'shan:* pertaining to Bœotia (q.v.); stupid; dull in intellect.

BOER (Dutch *boer*, a peasant or husbandman), a South African colonist of Dutch descent. The Cape Colony was founded by the Dutch in 1650. The colony subsequently fell into comparative neglect, and the colonists, left to their own resources, began to develop a character of their own. The colony was taken possession of by the English in 1795, restored at the peace of Amiens in 1802, taken again in 1806, and finally ceded to England in 1815. The last change was highly distasteful to the colonists. Naturally distrustful of a foreign government, they had formed from their experience of the country and its inhabitants a policy and habits of their own, into which the newcomers could not be expected at once to enter. The policy of the British governors was not always adapted to the circumstances, and the attempts of the British missionaries, encouraged by the colonial government, to convert and civilize the natives, excited the jealousy of the Boers, who thought their own interests compromised by the encouragement given to the converts. The emancipation of their slaves in 1833, and the cession to the Kaffirs in 1835 of a frontier district of neutral territory in the east, filled up the measure of provocation, and the Boers resolved to place themselves by emigration beyond the British rule. A first band set out by land in 1835 for Port Natal, but being ignorant of the passes of the country, went out

of their way. Part of them settled in the district near the Zoutpansberg or Salt-pan Mountain, part proceeded to Algoa Bay, but did not succeed in forming a perfect settlement. Another band also proceeding to Natal was attacked by the Matabele Kaffirs, and obliged to fall back on the Modder River. After receiving reinforcements they again advanced and settling in the Orange River district, formed a commonwealth under Peter Retief. In 1842, a British force was landed, and the Boers were compelled to retire from the coast and acknowledge the British sovereignty. Further disagreements with the colonial government, which had now possession of Natal, led to another emigration to the north of the Klipp River. Here they struggled successfully with the Kaffirs till 1845, when the colonial government proclaimed the Buffalo River the north boundary of Natal. The Boers openly resisted, but finding their strength unequal to the conflict, again emigrated to the Vaal country. In 1848 the colonial government likewise annexed by proclamation the Orange River settlement. The Boers, headed by Pretorius, took up arms, but being defeated retired beyond the Vaal, and with the previous settlers formed the Transvaal republic. Those who remained continued their resistance to the British authority until, in 1851, on the outbreak of the Kaffir war, the British relinquished the Orange River territory, and recognized the independence of the Orange Free State. In 1877 the Transvaal was annexed by Britain, according to the wish of many of the people, but war broke out in 1880, British forces suffered more than one defeat, and in 1881 the country was accorded a modified independence. In October 1899, after a defiant ultimatum, the united forces of the Transvaal and Orange Free State invaded Natal. After nearly three years of warfare the two republics were annexed by proclamation. See ORANGE RIVER COLONY; and TRANSVAAL, etc.

BOERHAAVE, *bōr'hâv* or *bôr'hâ-vėh*, HERMANN: 1668, Dec. 31—1738, Sep. 23; b. Voorhout, near Leyden: most celebrated physician of the 18th c. In 1682, he went to Leyden with the intention of becoming a clergyman, and there studied Greek, Latin, Hebrew, Chaldee, history, ecclesiastical and secular, and mathematics. In 1689, B. was made doctor of philosophy, and in 1690 began the study of medicine, reading carefully Hippocrates among the ancients, and Sydenham among the moderns. Though mainly self-educated in medicine—as in chemistry and botany—he gained his doctor's degree at Harderwyck, 1693, and returned to Leyden, where, in 1701, having abandoned theology, he was appointed lecturer on the theory of medicine, and in his inaugural lecture recommended to the students the ancient method of Hippocrates in medicine; but in 1703 his views had become greatly enlarged. He saw the necessity of *a priori* speculations, as well as of the Hippocratic method of simple observation, and elaborated various mechanical and chemical hypotheses to explain the diseases of the body, especially

in the case of the fluids. In 1709, he was elected prof. of medicine and botany in the place of Hotton. About this time, he published the two works on which his great fame chiefly rests: *Institutiones Medicæ in Usus Annuæ Exercitationis Domesticos* (Leyd. 1708), and *Aphorismi de Cognoscendis et Curandis Morbis, in Usum Doctrinæ Medicinæ* (Leyd. 1709), both of which went through numerous editions, and were translated into various European languages, and into Arabic. In the first work—a model of comprehensive and methodical learning—he gives a complete outline of his system, including a history of the art of medicine, an account of the preliminary knowledge necessary to a physician, and a description of the parts and functions of the body, the signs of health and disease, etc.; in the second, he gives a classification of diseases, with their causes, modes of treatment, etc. B. also rendered important services to botany. One of his best lectures is that delivered on his resignation of the office of rector of the univ., *De Comparando Certo in Physicis.* To combine practice with theory, he caused a hospital to be opened, where he gave clinical instructions to his pupils. Though so industrious in his own profession, he undertook, 1718, after Lemort's death, the professorship of chemistry, and published, 1724, his *Elementa Chemiæ*, a work which did much to render this science clear and intelligible, though now superseded by modern researches. His fame had meanwhile rapidly increased. Patients from all parts of Europe came to consult him. Peter the Great of Russia visited him; and it is even said that a Chinese mandarin sent him a letter, addressed 'Herr Boerhaave, celebrated physician, Europe.' He was a member of most of the learned academies of the day. He realized from his profession a fortune of two million of florins.—Burton, *Account of the Life and Writings of B.* (2 vols. Lond. 1743); Johnson, *Life of B.* (Lond. 1834).

BOERHAAV'IA; see Nyctaginaceæ.

BOERIO, *bo-ā're-o*, Joseph: 1754–1832; b. Lendinara, Italy: Italian jurist and legal writer. His father was a distinguished magistrate, who received him as coadjutor, when but 20 years of age. B. was successively appointed judge of various courts. He published in Italian excellent works, the principal of which are entitled: *Racolta delle leggi venete* (1793, 2 vols.); the *Pratica del processo criminale* (1815); *Repertorio del codice criminale austriaco* (1815): *Dizionario del dialetto Veneziano* (1827), etc.

BOERNE, or Borne, *bŭr-nĕh*, Ludwig: 1786–1837; b. Frankfort-on-the-Main, of Jewish extraction: celebrated German journalist and critic. He studied at Heidelberg and Giessen, and afterward became editor of the *Staats-Ristretto*, a democratic journal that was soon suppressed. Having abjured Mosaism for Protestantism, he became editor (1818) of the *Wage*, a periodical of literature, science, and art. In 1819, and again in 1822, he felt constrained to flee to France for a refuge against persecutions. Dur-

ing his last sojourn he published in the journals *Pictures of Paris*, charming articles, which have entitled him to a place among the best humorists. After the revolution of 1830 appeared his *Letters on Paris*, which had a great success with the revolutionary party in France, and were instrumental in agitating Germany. He published a translation of Lamennais's *Words of a Believer* (1834). In 1835, he wrote articles for the *Reformer*, a republican journal. His political friends raised a monument in his honor, executed by David (Pierre Jean) of Angers. Beside the works already cited, he wrote a curious history of the censorship of Frankfort, and *Menzel der Franzosen-fresser*, considered his best work.

BOËTHIUS, *bō-ē'thĭ-us*, ANICIUS MANLIUS SEVERINUS (to which a few MSS. add *Torquatus*): b. between 470 and 475; d. 524 or 526: Roman statesman and philosopher. The family to which he belonged had been distinguished both for its wealth and dignity for two centuries. His own father held the office of consul, but dying while B. was still a boy, the latter was brought up under the care of Festus, Symmachus, and other honorable Romans. He studied with enthusiasm philosophy, mathematics, and poetry, translated and elucidated with laborious care the writings of Aristotle and of the old mathematicians Euclid, Archimedes, Ptolemæus, and others; but the story of his 18 years' stay at Athens is entirely unhistorical. B. soon attracted notice; he became a patrician before the usual age, a consul in 510, and also *princeps senatus*. Having, moreover, gained the esteem and confidence of Theodoric, King of the Goths, who had fixed the seat of his government at Rome in the year 500, he was appointed by that monarch *magis er officiorum* in his court. His influence was invariably for the good of Italy, and his countrymen owed it to him that the Gothic rule was so little oppressive. His good-fortune culminated in the prosperity of his two sons, who were made consuls 522. But his bold uprightness of conduct, springing from strong faith in his philosophic ethics, and courage to regulate his official conduct by them—at last brought upon him the unscrupulous vengeance of those whom he had checked in their oppressions, and provoked by his virtues. He was accused of treasonable designs against Theodoric; and the king, despondent and mistrustful in his old age, was induced to listen to the charges. B. was stripped of his dignities, his property was confiscated, and he himself, after having been imprisoned for some time at Pavia, was put to death; according to one account, with circumstances of horrible cruelty. During his imprisonment, B. wrote his famous *De Consolatione Philosophiæ*, divided into five books, and composed in the form of dialogue, in which B. himself holds a conversation with Philosophy, who shows him the mutability of all earthly fortune, and the insecurity of everything save virtue. The work is composed in a style which happily imitates the best models of the Augustan age, and the frequent fragments of poetry

interspersed show truthfulness of feeling and metrical accuracy. The *Consolatio* is piously *theistic* in its language, but affords no indication that B. was a Christian; and if the doctrinal treatises ascribed to him are, as the acutest criticism maintains, not genuine, we must class him in religion rather with Marcus Aurelius than with his alleged friend, St. Benedict. He was the last Roman writer of any mark who understood the Greek language and literature. During the middle ages, he was regarded with profound reverence, as the *Augustine* of philosophy, but on the introduction of the Aristotelian metaphysics in the 13th c., his reputation gradually sank. The first edition of B.'s entire works appeared at Venice, 1491–2; a more correct one at Basel, 1570. The oldest edition of the *Consolatio* is that published at Nürnberg, 1473, but many manuscript translations into various languages had appeared long before the invention of printing—among them that by King Alfred into Anglo-Saxon.

BOG, n. *bŏg* [Ir. *bogach*, a bog or marsh: Gael. *bog*, soft; *bogan*, a quagmire]: a deep soft marsh; a tract of land, consisting of decayed vegetable matter, rendered soft by water. Bog-berry, a name for the Cranberry, *Vaccinium oxycoccus*. Bog-earth, a soil consisting mainly of decomposed vegetable matter. Bog-butter, a name given to fatty masses occasionally found in peat-mosses. Bog iron ore, a stratum or deposit of oxide of iron found in the bottoms of many bogs and peat-mosses. Bog-wood, the trunks and larger branches of trees dug up from peat-bogs. Bogtrotter, one who lives among bogs—formerly applied to the Scotch Border troopers or robbers, and to a similar class among the Irish, from the ability acquired by many of them of traversing the extensive bogs of their native country, passing from tussock to tussock, where a stranger would find no secure footing, and in the frequent use which they made of this ability to escape from soldiers, officers of police, or other pursuers; now sometimes applied in disparagement to a certain class of Irishmen. Bog-rush, a bird the size of a wren, inhabiting the bogs of Sweden. Bog-spavin, a tumor in the inside of the hough of a horse. Boggy, a. *bŏ'ggĭ*, full of bogs. Bog-bean or Buck-bean, one of the gentians, a plant possessing bitter tonic properties; the *Mĕnyăn'thes trĭfōlĭātā*, ord. *Gentĭănācĕæ*. Bog-myrtle, or Dutch myrtle, a well-known strong-scented shrub growing in moist boggy places; the *Myrĭcă gālĕ*, ord *Myrĭcācĕæ*. Bog-oak, the trunks and larger branches of oak and other trees dug from peat-bogs, having an ebony color, arising from an impregnation of iron.

BOG: a deep soft marsh; specially, a Peat-bog as distinguished from every other kind of swamp or morass. The spongy texture of the peat covering retains water, and converts the land into a kind of quagmire. The term Peat-moss is sometimes employed, particularly in Scotland, and even simply Moss. The word Bog is of Irish origin, being from a Gael. root, signifying a bobbing, quaking motion.

BOG.

Bogs of great extent exist in some of the northern parts of the world. A very considerable part of the surface of Ireland is occupied with them. The Bog of Allen (see ALLEN, BOG OF) is the most extensive in the British Islands, although its continuity is not altogether unbroken, strips of arable land intersecting it here and there. The Solway Moss (q.v.), on the w. borders of England and Scotland, is about seven m. in circumference. Chatmoss (q.v.), in Lancashire, famous for the engineering difficulties which it presented to the formation of the first great English railway, is 12 sq. miles in extent. The swamps of the e. of England are in general not peat-bogs, but consist chiefly of soft mud or silt.

The general surface of a bog is always nearly level, but usually varied with rushy tussocks rising above the rest, and having a rather firmer soil. By the continued growth of peat, the surface of a bog is gradually elevated; that of Chatmoss, for example, rises above the level of the surrounding country, having a gradual slope of 30 or 40 ft. from the centre to the solid land on all sides. In rainy weather, it sensibly swells, the spongy mass imbibing water, while the mosses and other growing plants on the surface prevent evaporation. Occasionally, the quantity of water becoming excessive, a bog *bursts*, and pours a terrible deluge down the course of a stream, causing great devastation, not only by the force of its torrent, but by the enormous quantities of peat which it deposits upon meadows and cultivated fields, as has recently happened in some memorable instances in Ireland. The depth of a bog is sometimes more than 40 ft. The spongy mass of which it is formed shakes on the least pressure. Sometimes it is impossible to traverse it; in other cases, it is possible only for those who are well accustomed to it, a false step being a plunge into a quagmire, in which a man sinks as in a quicksand.

One of the remarkable phenomena of peat-bogs is the frequent presence of roots and fallen trunks of trees, in a good state of preservation, many feet below the surface. From the black bog-oak of Ireland, various small fancy articles are manufactured. The fact that trees are found imbedded in bogs led to the inference that in many instances these morasses originated in the decay or partial destruction of ancient forests, but that theory is not accepted as wholly true. There is a popular division of bogs into two classes—*Red Bogs* and *Black Bogs;* the decomposition of the vegetable matter in the former being less perfect, and the substance, consequently, more fibrous and light than in the latter. There is indeed no precise line of distinction, and all intermediate conditions occur. The most extensive bogs are red bogs, and they are said to cover 1,500,00 acres in Ireland. Black bogs, although comparatively of small extent, are more numerous, particularly in elevated districts, for which reason they are sometimes called *mountain bogs*. The depth of red bogs is usually much greater than that of black bogs.

The conversion of bogs into good pasture or arable land is a subject of great importance. There can be no doubt that much of the land now occupied by bog is capable of being rendered very productive, while the effects of extensive bogs upon the climate are always injurious. The reclaiming of shallow mountain bogs is comparatively easy, and in some cases it is effected by a very simple and inexpensive drainage, and by throwing them at once under cultivation. Great difficulties, however, attend the reclaiming of red bogs. A chief difficulty, in some cases, is caused by the low situation of the bog, and the want of *fall* for drainage. Another great difficulty is presented by the spongy substance of red bogs being extremely retentive of water, so that a deep ditch drains only a very narrow strip on each side of it. A difficulty has been also found in disposing of the peat, where, a good soil being known to exist below, it has been attempted to reclaim land by removing the peat instead of draining it and converting its own surface into soil. To some extent, in such cases, the peat is advantageously disposed of for fuel, or to be used as a species of manure for other soils; but the demand for these purposes is often insufficient for any other than a very slow process of improvement in an extensive bog. The peat is therefore, sometimes, by various means, floated off, or a portion of the peat, taken from the upper surface, is not unfrequently burned in heaps upon the spot, the ashes becoming a manure, and assisting in the formation of a soil.

Of course, the first essential in the reclaiming of bogs is drainage. The method of effecting this must be varied according to circumstances; but very frequently, after a general outlet with sufficient fall has been secured, wide open drains are cut, by which the bog is divided into strips, which are again traversed and subdivided by smaller drains. When these drains begin to serve their purpose, the surface of the bog sinks, and their depth is reduced; they are then often deepened, and at last a permanent system of covered drains emptying themselves into open ditches is thus formed, and fits the land for all the purposes of agriculture. It is, however, often plowed before this state of things is attained, the plow-horses being shod with *pattens*; socks and coulters of unusual sharpness being employed for the cutting of the bog. Various implements have also been devised for cutting the moss, to facilitate cultivatio . Lime, calcareous sand, clay, and other manures are applied, according to circumstances, to promote the conversion of the peat into useful soil. Sometimes the first crop taken from the plowed bog is a crop of oats; sometimes it is found preferable to begin with rape, turnip, or the like. In some places in the North of Ireland, florin grass (see BENT GRASS) has been sown on bogs in process of being reclaimed and enormous crops have been obtained. See WASTE LANDS.

Throughout the U. S., along the seaboard to the gulf of Mexico, bog-like swamps are of frequent occurrence.

Their outer portions are sometimes wooded swamps, while within they present moss-covered heaths, stretching, like the western prairies, farther than the eye can see, and dotted occasionally with clumps or little islands of trees. In New England, the northwestern States, and Canada, the bogs furnish genuine peat, and some of those bordering on the Great Lakes are of great extent. On Long Island, near New York, the bogs present a marked feature along the sandy coast.

BO'GAN, or NEW-YEAR, RIVER, the *Allan Water* of Oxley: an interior stream of e. Australia, joins the Darling, after a generally n.w. course of more than 300 m., about lat. 30° s., and long. 146° e. Its source is in the Harvey Range; about lat. 33° s., and long. 148° 30′ e.

BOGAR'DUS, EVERARDUS: d. 1647: first minister of the Ref. Dutch Ch. in New Amsterdam, now New York; came to America about 1633. In 1638, he married a widow, Anneke Jans, owner of a 60-acre farm in a now important business part of New York. Sailing for Holland to answer certain ecclesiastical charges, he perished by shipwreck in the Bristol channel.—The heirs of B. have brought many suits for recovery of the above-named tract, which fell into possession of Trinity Church, but in vain, the title being secure.

BOG BUTTER, or BUTYRELLITE: substance found in some of the bogs of Ireland, and until quite recently supposed to be a mineral of vegetable origin, and classed among acid oxygenated hydrocarbons in mineralogy. But Macadam proved it to be of animal origin, formed by the decomposition of animal substances, out of contact with the air. In color and consistency it much resembles butter, and at 124° F. it becomes liquid. It is not soluble in water, but is readily dissolved by alcohol.

BOGDANOVITCH, *bog-dâ-no'vitch*, HIPPOLYTUS THEODOROVITCH: 1743, Dec.—1803, Jan.; b Perevolotchna, Little Russia. His fame rests entirely upon his poem *Dushenka*, published 1775. The story of Psyche forms the groundwork of the poem, which is characterized by a refined and graceful style, and vivacious playfulness of language. Its publication made him at once famous, as well as obtained for him the high favor of the court; but there can be no doubt that the popularity of the work was as much owing to the adventitious circumstances in which it was produced—nothing of the kind having been previously attempted in Russia—as to its intrinsic merits. B., though he wrote much afterward, never equalled his first performance.

BOGEN, *bō'ghĕn:* town of Bavaria, in the circle of Lower Bavaria, on the left bank of the Danube, about 6 m. e. of Straubing. It has extensive breweries, but is celebrated chiefly for its chapel, still a place of pilgrimage, built on a neighboring height. Here, according to tradition, a hollow stone image of the Virgin, floated up by the river. remained stationary; and its miraculous arrival

had the effect of converting a notorious robber-chief, the ruins of whose castle now inclose the church. Innumerable pilgrims flocked to the image, including at various times three German emperors, and the monks grew very wealthy on their offerings. Pop. 1,400.

BOGENHAUSEN, *bo'ghėn-how'zen:* village in Bavaria, lat. 48° 8′ n., lon. 11° 36′ e.; abt. 2 m. n.e. of Munich. It is the seat of the royal observatory of Munich, one of the best equipped in the world.

BOGERMANN, *bō'gĕr-mân,* JOHANN: 1576–1633; b. at the village of Opelwert, in Friesland: pres. of the Synod of Dort. He took a violent part in the religious controversies which inflamed, with unwonted fire, the Dutch mind at the beginning of the 17th c. His hatred of Arminianism extended itself to the persons who upheld it, and his zeal was on various occasions gratified by securing the punishment of those who had the misfortune to differ in opinion from him. He translated and recommended Beza's book on the *Capital Punishment of Heretics;* and about 1614, ventured to assail the great Grotius in a polemical treatise, which, with most of the angry literature of the period, has properly perished. In 1618, B. was elected pres. of the synod of Dort; but his conduct there does not seem to have given satisfaction to the Frieslanders who had delegated him, for he was accused on his return of having exceeded his instructions. For one thing, however, B. deserves great credit, his translation of the Bible into the vernacular. Four other persons were associated with him in the task, but the translation of the Old Testament is chiefly B.'s work, and is characterized by taste, fidelity, and purity of language. It is still used in the Dutch churches. B. died at Franeker, in the univ. of which he was primarius prof. of divinity

BOGEY, n. *bō'gĭ* [W. *bwg,* something to frighten: Slav. *bog,* a god]: a nursery name for an evil spirit; some goblin in particular. BUG applies to goblins in general.

BOGEY, or BOGIE, n. *bō'gĭ:* on *railways,* a small flat wagon used by surfacemen for conveying small quantities of material from point to point, and which may be easily lifted off and put on the rails; may have been so termed from the light low wagons employed in filling up the track for the Manchester and Liverpool railway over the Chat Moss or *bog.* BOGEY-ENGINE, an engine which, instead of resting on two wheels in front, rests and swivels on a *bogey* having four wheels, so as to take curves better

BOGGLE, v. *bŏg'gl* [imitative of a stammer or stutter, and represented by the syllables *gag* or *gog, bag* or *bog:* Bret. *gagoula;* Port. *gaguejar,* to stutter: F. *bagouler,* to gabble]: to start aside through fear; to doubt; to hesitate; to waver; to make difficulties over a matter. BOG'GLING, imp. BOGGLED, pp. *bŏg'gld.* BOG'GLER, n. *-glėr,* one who. BOG'GLISH, a. doubtful.

BOGGS, *bŏgz,* CHARLES STUART: naval officer: 1811, Jan.

28—1888, Apr. 22; b. New Brunswick, N. J. He was appointed midshipman 1826, Mar. 1, and promoted lieut. 1837, Sep. 6. During the Mexican war he was attached to the *Princeton.* He was promoted commander 1855, Sep. 15. He was with Farragut in the attack on the forts at the mouth of the Mississippi 1862, when he destroyed two rams which sank his ship. He was promoted capt. 1862, July 16; commodore 1866, July 25; rear-admiral 1870, July 1; and retired 1873.

BOG IRON ORE: mineral of very variable composition, but regarded as consisting essentially of peroxide of iron and water; the peroxide of iron often amounts to about 60 per cent., the water to about 20. It contains a high percentage of sulphur, phosphorus, and other substances, so that it is not widely used for iron manufacture. B. I. O. occurs chiefly in alluvial soils, in bogs, meadows, lakes, etc. It is of a brown, yellowish-brown, or blackish-brown color. Some of its varieties are earthy and friable, formed of dull dusty particles; some are in masses of an earthy fracture, often vesicular; and some more compact, with conchoidal fracture. It is abundant in some of the n. and w. islands of Scotland, and in the n. countries of Europe generally; also in N. America. In respect to the source of B. I. O., the iron everywhere present in soils as yellow, brown, or red coloring, and often as a peroxide constituent of minerals in rocks, is reduced to protoxide by organic matter in solution (this matter taking 3 of the 5 atoms to oxodize itself); the protoxide unites with carbonic acid, forming iron carbonate, which is soluble in excess of the acid. Thus the iron is leached out, and, when again peroxidized by air, deposited in the basins that become bogs, where the iron is usually the hydrated peroxide, yellow in powder. Upturned beds, metamorphosed into magnetic iron ore, had the same origin.

BOGLE, or Boggle, a. *bō′gl* [from *bo* or *boo*, the cry made by a person with his face covered by his hands to frighten children; W. *bwg;* It. *bau*]: a bugbear; something that terrifies.

BOGODOUKHOV, *bo-go-dô-kov′*, or Bohodukhov′: fortified town of Russia, in the govt. of Kharkov, on the Merle, 29 m. n.w. of the city of Kharkov. The chief industry is leather-dressing and boot-making. B. has considerable trade in cattle and hides. Pop. about 12,000.

BOGOMILI, *bō-go-mī′lī:* religious sect which came into notice in the 12th c., whose chief seat was in Thrace. They resembled the Paulicians and Cathari. Their name, derived from the Bulgarian *Bog,* 'Lord,' and *milui,* 'have mercy,' refers to the frequency of their prayers. The basis of their creed was as follows: Out of the eternal Divine Essence or Being sprang two principals—Satanael and Logos; the former, at first good, afterward rebelled, and created in opposition to the original spiritual universe a world of matter and human beings. These human beings, however, received from the Supreme Father a life-spirit; but this

was kept in slavery by Satanael until the Logos or Christ came down from heaven, and assuming a phantom body, broke the power of the evil spirit, who was henceforth called only Satan. The B., like all similar sects, practiced a severe asceticism, despised images, and rejected Baptism and the Lord's Supper. Instead of Baptism they placed their hands and an apocryphal gospel of St. John on the head of the neophyte, singing at the same time the Lord's Prayer, which they repeated seven times during the day, and five times during the night. They accepted the whole of the New Testament, but of the Old Testament only the Psalms and Prophets, which they interpreted allegorically. In 1118, that vehement hater of heretics, Alexius Comnenus, burned their leader Basilius. Persecution, however, did not put an end to the B., and at the time of the Mohammedan conquest of Bosnia (16th c.), we find that the greatest number of the renegade Christians who embraced the religion of the conquerors belonged to this sect. There are some B. even at the present day.

BOGOTA, *bo-go-tâ'*, more fully SANTA FÉ DE BOGOTA: federal capital of the united states of Colombia, formerly New Granada, S. America. It is within the limits of Cundinamarca; lat. 4° 6′ n., and long. 78° 30′ w., on a table-land, which, at an elevation of 8,694 ft. above the sea. separates the basin of the Magdalena from that of the Orinoco. Independently of its political importance, B. occupies a commanding position in relation to commerce. It lies on the most convenient route between Quito and the Caribbean Sea; while by navigable affluents of the Orinoco and the Magdalena, distant respectively 37 and 55 m., it has a two-fold access to tide-water. Its immediate vicinity, too, is favorable to the growth of a great city and the maintenance of a large population. The table-land measures about 60 m. from n. to s., and about 30 from e. to w., being bounded on all sides by mountains which, though lofty enough to give shelter, are yet below the line of perpetual snow. This extensive plain—a temperate zone on the verge of the equator, with a singularly genial and salubrious climate—is exceedingly fertile, yielding abundant crops of wheat and barley, as also generally of the leguminous plants cultivated in Europe; while, favored as it is with two rainy seasons in a year, it is as rich in pasture as in grain, affording ample sustenance to numerous flocks of sheep and herds of cattle. B. was founded 1538, consisting then of 12 houses in honor of the 12 apostles. Prospectively, also, the surrounding mountains promise, one day, to give to industry many valuable minerals, such as iron, coal, and salt. The last two, in fact, have already been obtained to some extent. Mines of emeralds, gold, silver, and copper also are said to be within the same district. B. is regularly and handsomely built. It has four public squares and five elegant bridges over two small rivulets—the San Francisco and the San Augustin. Like every place in Spanish America, it teems with churches and convents—two of the latter overhanging the city on twin hill-tops at a height of 2,500 ft. above the general level. B.

likewise possesses, in addition to official buildings, a mint, a theatre, a university, and spacious barracks. A short way from the city, the rivulets above mentioned join a stream of the same name as the town itself.—The river Bogota, otherwise called the Funcha, is in itself an object of physical interest. It is the single outlet of the waters of the table-land, which, both from geological features and from aboriginal traditions, appears to have once been a land-locked basin, somewhat like the still loftier and larger plateau of Titicaca. Be this as it may, the river B. has found, if it has not forced, a passage for itself toward the Magdalena. At the cataract of Tequendama the waters plunge over a precipice 900 ft. high; and the clouds of spray clothe the adjacent grounds in the most luxuriant vegetation. About the centre of this cataract, known as the Fall of Tequendama, stands the natural bridge of Icononzo, formed as if by the fortuitous jamming of rocks from the opposite sides of the cleft. Between the crest and the foot of this fearful torrent, there exists a difference of climate, which is obviously disproportioned to a mere difference of elevation; and the excess may perhaps be ascribed, in conjunction with the ceaseless moisture, to the wall-like precipice behind, which, besides intercepting the winds, increases by reflection the heat of the sun. Pop. of B. is officially estimated at 130,000.

BOGOUSLAV, or Boguslaw, *bo-gô slâv':* town of Russia, govt. of Kiew, about 70 m. s.s.e. of the city of Kiew; on the Rossa. Pop., chiefly Jews, 9,000.

BOG SPAV'IN: swelling of the hock joint of the horse. It appears in two forms. In the more serious, there is inflammation of the upper part of the joint making the animal lame and liable, if not checked, to cause the deposition of a bony substance that will prevent all movement of the joint. It is caused in various ways, as by sprains, rheumatism, overwork, or accident; and is far more likely to appear in young horses than in those which are fully matured, though in the latter it is more difficult to control. The use of bandages, astringent lotions, rubbing gently with the hand, and rest for a few days will usually cause marked improvement. Blistering is often resorted to, but it is to be recommended only in severe cases and after the heat and soreness have been reduced. Even in these cases, firing with the iron at nearly white heat is more desirable; but this treatment, as well as blistering, should be by a veterinarian.—Another form of B. S. is a dropsical effusion which distends the mucous capsule of the joint and causes a swelling, but, except at its first appearance or from a subsequent injury, does not cause lameness, heat, or tenderness. The milder measures indicated for the other form of the disease usually prove beneficial, but severe exertion is likely to cause recurrence of the evil. Distention of the vein which passes over the spot at which B. S. appears, and which is often caused by that disease, is known as blood spavin. As it does not lead to serious results, no special treatment is required. See Spavin.

BOGUE, *bōg*, DAVID: 1750, Feb.—1825, Oct.; b. Hallydown, Berwickshire: Congl. minister, founder of the London Missionary Soc. After studying at Edinburgh Univ., and obtaining his license as a preacher in connection with the Church of Scotland, he, 1771, went to London, where he was for some time a teacher. He afterward accepted the charge of an Independent or Congl. church at Gosport, where he established a seminary for the education of students for the Congl. ministry, an institution which had a great influence on the connection, as well when it had this object in view as afterward, when it became a school for the training of missionaries. B. now conceived the grand missionary scheme, ultimately realized in the London Missionary Soc. He was active in the establishment of the British and Foreign Bible Soc., and the Religious Tract Soc. On his death, an extraordinary meeting of the London Missionary Soc. was convened, to express its sense of bereavement, and of the great work which he had done for Christian missions. B. was the author of *An Essay on the Divine Authority of the New Testament*, which has had a circulation only second to that of Bunyan's *Pilgrim's Progress*, having been translated into French, Italian, German, and Spanish; also *Discourses on the Millennium;* and in connection with Dr. James Bennet, a *History of Dissenters*, from the Revolution of 1688 to 1808.

BOGUS, a. *bō'gŭs* [Amer. slang—said to be from a swindler named *Borghese*]: anything counterfeit; spurious.

BOHEA, n. *bō-hē'* [from *Bouy* or *Booy*, a mountain in China]: a common black tea.

BOHEMAN, CHARLES ADOLPHUS ANDERSON: 1770–1830; b. Sweden: a mysterious person, who left his native country while very young, and returned unexpectedly in 1802, the possessor of considerable money, of which nobody knows the source. It was supposed that it was not acquired by honorable means, and he was accused, either of having stolen Marie Antoinette's jewel-case, at the time that the royal family fled from Paris (B. being then engaged as sec. to the Count de Fersen), or of having snatched from a wealthy Englishman his casket containing his money and his papers; but neither of these accusations could be substantiated. He returned to Sweden to marry a poor young girl to whom he had been betrothed before his departure. It is said of him that he was agreeable in his intercourse, and that his benevolence toward the needy and public institutions was very great. He also exercised a powerful influence over some great personages, among them Duke Charles. Fearing that he might gain the ascendency over Gustavus Adolphus, he was represented as a man politically dangerous, and the king sent him into exile. After the revolution of 1809, B. was permitted to return; and B. soon regained credit with his old benefactor, now King Charles XIII.; but in 1814, he was again the victim of new and unjust suspicions, and was arrested and carried beyond the frontier. He protested in vain; and retired to Germany, where he spent the rest of his life.

BOHEMIA.

BOHEMIA, *bō-hē′me-a* (Ger. *Böh′men*): formerly one of the kingdoms of Europe, now forming a part of the Austro-Hungarian monarchy; in lat. 48° 33′–51° 3′ n., and long. 12°–16° 46′ e. It is bounded n. by Saxony and Prussian Silesia, e. by Prussia and Moravia, s. by Lower Austria, and w. by Bavaria; 20,060 sq. m.; pop. (1869) 5,140,544; (1900) 6,318,697. It is divided into thirteen circles—viz., Prague, Leitmeritz, Jung-Bunzlau, Jiĕin, Königgrätz, Chrudim, Caslau, Tabor, Budweis, Pisek, Pilsen, Eger and Saaz. B. is surrounded on all sides by lofty mountain-ranges, the principal of which are the Riesengebirge (part of the Sudetic chain) on the n.e., dividing B. from Prussia and Silesia, and attaining, in the peak of the Schneekoppe, a height of 5,275 ft., on the n.w., the Erzgebirge, with a height in some places of more than 4,000 ft.; on the s.w., the Böhmerwald, reaching in its highest point 4,613 ft. Offsets from these traverse the interior of the country, which has an undulating surface, sloping generally to the centre. B. has several fine valleys, chief of which are those of the Moldau and the Elbe. The country belongs to the upper basin of the Elbe, which rises in the Riesengebirge range; and it is well watered by the affluents of that river, the principal of which are the Moldau —which has its source in the Böhmerwald (or Bohemian forest, covering the mounatin boundary between B. and Bavaria and separating the basins of the Elbe and the Danube), and which is navigable from Budweis to Melnik, where it joins the Elbe, a distance of 148 m.—the Eger, Iser, Aupa, Metau, Biela, and Erlitz. B. has no lakes of any considerable size.

The climate of B. is cold in the mountainous regions, the higher peaks being covered with snow during a great portion of the year, but mild in the valleys, and, on the whole, healthful.

The mineral wealth of B. is varied and extensive, consisting of silver, tin, copper, lead, iron, cobalt, alum, sulphur, graphite, calamine, cinnabar, porcelain clay, with several precious and ornamental stones, such as Bohemian garnet (*Pyrope*), rubies, sapphires, etc. Of coal, B. produces more than all the rest of the Austrian empire together. It also yields a large supply of asphaltum. Mineral springs are abundant, and those of Carlsbad, Marienbad, Eger-Franzensbad, Teplitz, Elisenbad, etc., are celebrated places of resort.

The soil of B. is generally fertile; more than one-half of the area consists of arable land, and forests cover nearly a third. The wheat raised in B. is about a seventh of the produce of the whole Austrian empire. The rye, barley, and oats are, the first a fourth, and the latter two a sixth of all the produce of these kinds of grain. This indicates great agricultural importance to the country, in relation to the Austro-Hungarian empire. Flax and hops are important products in a manufacturing point of view; and Bohemian hops are famous. A great variety of fruit is cultivated and exported in large quan-

tities. The culture of the vine is confined to the vicinity of Prague and the lower part of the Elbe.

Various kinds of game are found, and the breed of pheasants is celebrated. Horned cattle, sheep, goats, and swine are reared extensively in some districts; and in the south, geese form an important item in the resources of the country.

In manufactures, B. holds a very high place among European countries. It is the chief centre of dyeing and calico-printing. The linen manufacture, more extensive than that of all the other Austrian provinces together, consists of damask, cambric, lawn, and other fine varieties, in addition to the ordinary qualities of cloth. The chief seat of the woolen-manufacture is Reichenberg and its neighborhood. Another important branch of industry is the paper-manufacture, of which B. possesses more than the half. The glass-works of B. are celebrated, and very numerous and extensive, affording employment to thousands. Beet-root sugar is manufactured extensively, and there are hundreds of breweries and brandy distilleries throughout the country, but mostly on a small scale. The manufacture of iron is considerable. The position of B. secures it a large transit trade. Steam-packets ply on the Elbe and Moldau; the horse-railway which, till 1869, connected these rivers at Budweis and Linz, was the oldest on the continent. B. has good roads, and there is an excellent system of railways centering in the capital, Prague.

Population, Religion, and Eucation.—The Czechs, a Slavonic race, form the bulk of the people. They are abt. 3,610,500, and dwell chiefly in the centre and e. of the country. The Germans, abt. 2,232,000, reside mainly on the outskirts, especially in the n.e. The great majority of the total pop. belong to the Rom. Cath. Church, but other religions are tolerated; the Protestants amount to only 120,000, and the number of Jews is about 100,000. The Rom. Catholics are under the supervision of the Abp. of Prague, and the three Bps. of Leitmeritz, Königgrätz, and Budweis. The monasteries and convents number between 120 and 130. Education is much more widely diffused than in any of the other provinces of Austria. The educational establishments include the Univ. of Prague, gymnasia, and other higher schools; besides over 4,000 public schools. B. sends 110—about a fourth of the 425—members to the lower house of the Austrian reichsrath, or parliament of the w. part of the empire.

History.—The *Boïi* (q.v.), from whom B. derives its name, settled in the country B.C. 2d c., but were expelled by the Marcomanni about the beginning of the Christian era. The victors themselves soon gave place to others, and as early as the 5th c. B. was peopled by the Czechs, a Slavic race. In the latter part of the 9th c., Swatopluk, the king of Moravia, subjugated Bohemia and introduced Christianity. After his death, the dukes of Prague, who in 1061 had the title of king conferred on them by the emperor Henry IV., ruled the country as a state in the

German empire until 1306, when the last of the dynasty was assassinated.

From 1310 to 1437, B. was ruled by kings of the House of Luxemburg. In the time of Wenzel IV. (Wenceslas), a reformation of religion took place under John Huss (q.v.) and Jerome of Prague (q.v.). After the death of Wenzel IV., the imprudent measures adopted by the emperor Sigismund excited in B. a war of sixteen years' duration, which ended in making B. an elective kingdom. In 1458, the shrewd and able Protestant noble, George von Podiebrad, ascended the throne. His successor, Ladislaus (1471–1516), was elected (1490) to the throne of Hungary, and removed the royal residence to Ofen, where also his son and successor, Lewis (1516–26), resided. After his death in battle against the Turks at Mohacz (1526), B. and Hungary passed into the hands of Ferdinand I. of Austria, who had married Lewis's sister. From that time, the hishory of B. merges in the history of Austria (q.v.).

Bohemian Literature.—The Czechs of B. possess a literature older than that of any other people of the Slavonic stem. Its origin may be dated with certainty as early as the 10th c. Of the oldest period—or before the time of John Huss the reformer—21 poetical and more than 50 prose works are extant. Among the former, the remains of a collection of ballads, etc., made in the 13th c., are remarkable for poetical merit. John Huss in B., like Luther in Germany, began a new era in literature (1409–1526); but the impulse of his example was far more important than his own writings. The literary remains of the Hussite sects in the 15th c.—dogmatic, polemic, and ascetic works—are still numerous in the old libraries and archives of B., though very many of them perished in the flames kindled by the Jesuits during the Thirty Years' War. Even so late as 1750, the Jesuit Antony Konias, boasted that he had burned 60,000 Bohemian books. Of historical works of this period, some remains have been edited by Palacky in his *Scriptores Rerum Bohemicarum*, 1829.

The period 1526–1620 is regarded by the Bohemians as their golden age of literature. In this time, especially under Rudolf II. (1576–1611), the arts and sciences were generally cultivated, Prague had two universities and sixteen schools, and the Bohemian language had reached its highest cultivation. It cannot, however, be said, that the literary works of this period display any great originality of genius. Among the most noticeable is a Bohemian translation of the Bible, finished in 15 years by eight scholars, assembled by John of Zerotin at his castle of Kralic, in Moravia, and published 1579–93. It is a model of pure and elegant Bohemian.

In 1774, Dec., an imperial decree was issued, ordaining that the German language should be employed by all teachers, lecturers, etc., in the upper schools. This harsh measure excited considerable opposition; and several writers came forward to vindicate the claims of the persecuted dialect, and to develop its powers; but their efforts had small success.

A new and better era began, 1818, with the discovery of valuable remains of old literature, and the publication of edicts favorable to the use of the Bohemian language in schools. Since that time, the progress of the language, as a vehicle of literature and science, has been rapid, and a love of the old dialect has been extended through all classes of society. In Bohemian poetry and belles-lettres, the names of Czelakowsky, Kollar, Holly, Langer, and Schneider are distinguished. Among scientific writers, mention may be made of Jungmann, Schafarik, Wenzel Hanka, and Presl. In history and archeology, the names of Palacky, Tomek, Schafarik, and Wocel are worthy of notice. Papers entirely political and of mixed politics and literature circulate more largely in B. than in any other part of the empire. Since 1831, a committee for the cultivation of Bohemian literature has been in existence.

The *Bohemian language*, harshest and strongest of the many dialects of the Slavonic family, is one of the best dialects of the West Slavonic; it is spoken not only in B., but also in Moravia, and among the Slowaks in Hungary. Among its sister-dialects, it is distinguished by copiousness of root-words, great flexibility in combinations, precision, and accurate grammatical structure; but, like all the Slavonic and most modern dialects, it has no specific form for the passive voice of the verb. The orthography introduced by John Huss in the 15th c. is precise and consistent with itself. Every letter of the Roman alphabet has its one distinct sound. Bohemian prosody is distinguished from that of most European languages by the use of quantity instead of accent, so that it can copy faithfully all the ancient Greek and Roman metres. No other modern language can translate the ancient classics so readily, and yet so completely and forcibly, as the Bohemian. Its grammatical forms are complicated and difficult.

BOHEMIAN BRETHREN; a religious society instituted in Prague about the middle of the 15th c.; originally composed of remnants of the Hussites. Dissatisfied with the conduct of the Calixtines (q.v.), they betook themselves, 1453, to the borders of Silesia and Moravia, where they settled. Here they dwelt in separate communities, and were distinguished by the name of Brothers of the Rule of Christ. Their adversaries often confounded them with the Waldenses and Picards, while, on account of their being compelled during persecution to hide in caves and solitary places, they were also called cave-dwellers (*Gruben heimer*). In spite of oppressions, such was the constancy of their faith and purity of their morals that they became profoundly respected, and their numbers greatly increased. The chief peculiarity of their creed was the denial of the ordinary Rom. Cath. doctrine of transubstantiation; but, in truth, they rejected tradition generally, and professed to found their tenets only on the Bible. Their ecclesiastical constitution and church discipline—of which the Lutheran reformers spoke highly—was an imitation of that of the primitive

Christian communities. They even went the length of practically denying anything to be secular; and, under the impression that religion should consciously penetrate and characterize the entire life of men, they extended ecclesiastical authority over the very details of domestic life. Their chief functionaries were bishops, seniors and conseniors, presbyters or preachers, ædiles, and acolytes. Their first bishop was consecrated by a Waldensian bishop, though they never united themselves with the Bohemian Waldenses. It was against their principles to engage in war; and having, on several occasions, refused to take up arms, they were at last deprived of their religious privileges. The result was that in 1548, about a thousand of the Brethren removed to Poland and Prussia. The contract which these exiles entered into with the Polish reformers at Sandomir, 1570, Apr. 14, and still more, the religious peace concluded by the Polish states in 1572, secured their toleration; but subsequently, in consequence of the persecutions of King Sigismund III., they united themselves more closely to the Protestants, though even at the present day they retain something of their old ecclesiastical constitution. The Brethren who remained in Bohemia and Moravia obtained a little freedom under the emperor Maximilian II., and had their chief seat at Fulnek, in Moravia. In the 17th c., a number removed into Hungary but during the reign of Maria Theresa were coerced into Rom. Catholicism. The Thirty Years' War, so disastrous to the Bohemian Protestants, entirely broke up the societies of the Bohemian Brethren; but afterward they united again, though in secrecy. Their exodus about 1722 occasioned the formation, in Lusatia, of the *United Brethren*, or Herrnhuters: see MORAVIANS.

BOHEMIANS, n. plu. *bŏ-hē′mĕ-ănz* [as if from *Bohēmĭă*, and so a sort of outcasts]: gypsies; imposters; literary men and artists of loose and irregular habits, who have consequently lost caste; formerly used to designate some followers of John Huss in Bohemia in 15th century; also applied to the Moravian Brethren.

BOHEMOND I., *bō′he-mŏnd*, Prince of Antioch: abt. 1056–1111; eldest son of the Norman conqueror of Apulia and Calabria, Robert Guiscard. In his youth he distinguished himself in his father's war against the Byzantine emperor, Alexis Comnenus (1081–85). After his father's death, he was excluded from the throne of Apulia by his brother Roger, and only gained the principality of Tarentum after a long contest. He joined the crusade of 1092 with a large army—most of which he had won over from his brother's service—and was conspicuous in the fight of Dorylæum, in Cilicia, 1096, and at the capture of Antioch, 1098. While the other Crusaders advanced to storm Jerusalem, B. remained in Antioch, where he established himself as prince. Being soon after besieged, the Christians, reduced to extremities, came out, and gave the sultan battle, and entirely routed his forces, B. greatly distin-

guishing himself in the fight. He was afterward made prisoner by a Turkish emir, and remained two years in captivity. Tancred, meanwhile, looked after his interests in Antioch. B. returned to Europe to collect troops, and after defeating Alexis in several engagements, was acknowledged by that emperor as Prince of Antioch. He died in Apulia.

BOHEMOND II., Prince of Antioch: son of B. I., a minor at the death of his father; assumed the government of Antioch, 1126 (after Tancred had been regent for some years), and was killed in battle 1130.

BOHEMOND III., grandson of B. I., was allowed to retain sovereignty only by the clemency of Saladin, and died 1201.—B. IV. (1233–51) and B. V. (d. 1275) were insignificant princes; and with B. VI. the Christian dynasty in Syria was brought to a close.

BÖHME, *bö'mĕh*, or BÖHM, *böm*, JAKOB: 1575–1624, Nov. 27; b. of poor parents at Altseidenberg, near Görlitz, Upper Lusatia: German mystic and theosophist. He spent his boyhood in tending cattle, receiving no instruction till he was ten years of age; but even then, the contemplation of earth and sky had so excited his naturally pious imagination, that he conceived himself inspired. He learned the trade of a shoemaker, but continued to devote much of his time to meditation on divine things. About 1612 was published his first book, called *Aurora, or the Morning Redness.* It contains revelations and meditations upon God, Man, and Nature; shows a remarkable knowledge of Scripture, especially of the apocalyptical books; as also a familiarity with the writings of the mystico-philosophic alchemists. It was condemned by the ecclesiastical authorities of Görlitz; but the persecutions to which its author was subjected had not the effect of convincing him of error. B.'s fundamental speculation is, that the forthcoming of the creation out of the divine unity—which is itself distinguishable into a trinity—can be contemplated by mystic illumination, and expressed in words. The object of his mystic contemplation, accordingly, is two-fold: first, God himself apart from creation, or, to use some of B.'s own synonyms, the groundless, the eternal One, the silent nothing, the *temperamentum;* and, secondly, the forthcoming of the creature out of God. This forthcoming of the creation, which is also an in-going of the silent nothing, is, according to B., the principle of negation, and he calls it 'contrariety.' 'All things,' he says, 'consist in Yes and No. The Yes is pure power and life, the truth of God, or God himself. The No is the reply to the Yes, or to the truth, and is indispensable to the revelation of the truth. So, then, the silent nothing becomes something by entering into duality;' and so on into what to most minds will seem utter unintelligibility. Numerous attacks from theologians disturbed B.'s last years, but he bore them all with great meekness. They were probably occasioned by a tract on repentance which his friends had printed without his knowledge; and so great was the interest excited, that he was induced by the solicitations of cer-

tain courtiers and of his friends to visit Dresden for the purpose of having his doctrines investigated. The court applauded and protected him. On returning to Görlitz, he took ill, and died. The first collection of his writings was published by Betke (Amsterdam, 1675); the most complete in 1730, at the same place; and the latest (1831–46) by Schiebler, at Leipsic. Next to Germany, Holland and England are the countries in which B.'s works have been received with most favor. In England, where B. was generally called Behmen, a translation in 2 vols. quarto was published, 1764. Sir Isaac Newton studied him; William Law of Oxford might be called his disciple; in 1697, Jane Lead, a fanatical disciple of B., founded a sect, called the Philadelphists, for the exposition of his writings; and John Pordage a physician, also is famed among his English interpreters. Abraham von Frankenberg (d. 1652) published the earliest biography of Böhme. In modern times, and in connection with speculative philosophy in Germany, his views, which had come to be regarded as empty mysticism, have acquired fresh interest and importance. This arises from the kindred character of his fundamental principle with the spirit pervading the systems of Spinoza, Schelling, and Hegel. The intellectual contemplation of the absolute, out of which the contradictions in the world of phenomena proceed, and into which they return, is common to these systems and to B.; Hegel, indeed, expressly represents B.'s negativity, the active principle of development, as an obscure foreshadowing of his own intuitions, and on that account places himself at the head of modern philosophy. The terminology of his philosophy, as will be seen from what we have quoted, is fantastic; but his imagination often conceives splendid ideas, which are more profoundly appreciated, and are the source of richer and more fruitful suggestions, in the 20th than they were in the 17th c. See Martensen's (1882) and Hartmann's (1893) works on B. and his philosophy.

BOHN, *bōn*, Henry G.: 1796, Jan. 4—1884, Aug. 22; b. London, of German parentage: author, translator, and publisher. It is impossible to estimate too highly his services to the community by republishing, at a cheap rate, a vast number of the most valuable works in literature, science, philosophy, theology, etc. Such collections as the Standard Library (130 vols.), the Scientific Library, Library of French Memoirs, the Illustrated Library, the Classical Library (translations of the Greek and Latin authors), the Antiquarian Library, the Ecclesiastical Library, etc., contain the intellectual wealth of both the ancients and moderns. The whole number of volumes contained in these series exceeded 600. In 1864 and subsequent years he sold all his copyrights and other business property, thus realizing a sum of nearly $500,000. Among his own works were: *The Origin and Progress of Printing* (1857); *Biography and Bibliography of Shakespeare* (1863). He also obtained distinction as the editor of the *Bibliotheca Parriana*, of Lowndes's *Bibliographer's Manual*, etc., and as translator of Schiller, Goethe and Humboldt. He com-

piled a *Polyglot of Foreign Proverbs,* Handbooks of Games and Pottery, and a *Dictionary of English Poetical Quotations.*

BOHOL: one of the Philippine Islands, belonging to the Visayas or Bisayas group. It has an area of about 1,300 sq. m. and an estimated population (1901) of 260,000. The interior of the island is mountainous. The coasts are low and sandy, and as a general rule do not offer security to ships. Sugar cane, rice, coffee, tobacco, cotton, and other agricultural products are grown, and it is reported that there are rich gold deposits. The most important town is Tagbilarian, a port on the s.w. coast. In the n. is Calape. These ports were officially declared open to commerce 1899, Dec. 11.

BOIAR, *boy'ar:* word originally of the same meaning as Czech, Lech, and Bolgarin, i.e., free proprietor of the soil. The Boiars, in old Russia, were the order next to the knjazes or knjeses (ruling princes). They formed the immediate 'following' of these princes, and bore somewhat of the same relation to them as the less important English and Scottish knights of the feudal ages did to the great barons Percy, Douglas, etc. They had their own partisans, who served them as a kind of body-guard; they gave their services to a prince of their own choice, whom, however, they left again at their pleasure, and, in consequence of this, the knjazes could secure their allegiance only by the bestowment of privileges often abused. They held exclusively the highest military and civil offices, and were so universally looked up to by the mass of the people, that the most powerful rulers, even Ivan the Cruel, considered it prudent to use this form of expression in their ukases: 'The Emperor has ordered it; the Boiars have approved it.' Rank among the Boiars was always proportioned to length of state-service, and was observed with the utmost rigor, so that the B. who had obtained an office, as it were, yesterday, looked down with contempt on him who entered on his only to-day. This singular mode of securing gradation of rank was called *miestniczestwo.* It was a peculiar phenomenon of Slavic life, equally unlike feudalism and modern aristocracy, and must be regarded as a strictly national development. In their housekeeping the Boiars were excessively fond of splendor, and their contempt for the serfs or 'lower orders' was immeasurable. In the lapse of time, many Chinese customs—as might be expected from their theory of rank—crept into their public life. Their power, and the respect which was paid them, acted as a wholesome check upon the otherwise unbridled authority of the princes; in consequence of which, the latter became their bitter enemies, and often sought to destroy their power. This was finally done by Peter the Great, who abolished the order of Boiars by giving them a place among the Russian nobility, but, at the same time, stripping them of their peculiar privileges. The last Russian B., Knjaz Ivan Jurjewicz Trubeckoj, died 1750, Jan. 16.

In Moldavia and Walachia, Boiars still exist. They have a seat and vote in the council of the prince, and, as

recent history shows, exercise at times an extensive influence.

BOIARDO, *bo-yar'do*, MATTEO MARIA, Count of Scandiano: 1430 (or 34)–1494; b. Scandiano, It.; celebrated Italian poet. After completing his studies at the Univ. of Ferrara, he was introduced at the court of Duke Borso d'Este, by whose successor, Ercole I., he was promoted to several honorable offices. In 1478, he was made gov. of Reggio; in 1481, gov. of Modena; and six years later, he again became gov. of Reggio, where he died. His chief work is the romantic chivalrous poem, *Orlando Innamorato*, which he left unfinished in three books. Former writers had described Orlando only as a cold, pure champion of Christendom; but B. introduced a romantic charm in the element of love—thus bringing his conception nearer to the reality of history, B. furnished to all his poetical successors the personages who figure in their adaptations of the old romance; particularly to Ariosto, whose *O. Furioso* is a continuation of B.'s poem. His work was printed first in 1486, and 16 times before 1545, and was translated into French and Spanish. From the dialect of the court of Ferrara, new versions unsatisfactory to the Florentines, were made (1541 and 1545) by other hands. Finally the original text was published with the critical observation the original text was republished with critical observations by Panizzi (9 vols. Lond. 1830), and afterward by Wagner (Leip. 1833). The other works of B. include *Sonetti e Canzoni* (Reggio, 1499); *Il Timone*, a five-act comedy (1500); *Cinque Capitoli in Terza Rima* (1523); and *L'Asino d'Oro*, a metrical version of the *Golden Ass* of Appulcius (1523); besides a translation of Herodotus (1533), and of Riccobaldi's *Chronicon Romanorum Imperatorum*. B. was a man of amiable and benevolent disposition.

BOIELDIEU, *bwâl-de-ëh'* ADRIEN FRANÇOIS: 1775–1835, Oct.; b. Rouen: French musical composer. At the age of 18 he produced a one-act opera in his native town. In 1795 he went to Paris, and was elected prof. in the Conservatoire de Musique when it was established. In 1803, he was appointed by the emperor Alexander of Russia, chapel-master at the imperial court. After eight years in Russia, during which he produced several operas, he returned to Paris, where he brought out his most popular piece, *La Dame Blanche;* also *Jean de Paris, Le Petit Chaperon Rouge*, etc. At his death in Paris, the nation honored him with a public funeral; his native city claimed his heart, voting 12,000 francs for the pomp of its reception in the cathedral. The govt. granted his son a pension.

BOIES, *boyz*, HORACE: b. Aurora, Erie co., N. Y., 1827, Dec. 7———————. After practicing law in Buffalo, N. Y., he settled in Waterloo, Ia., 1867, as a lawyer and a farmer on a large scale. He was a republican till 1886, then became a democrat, and was elected gov. of Iowa 1889, re-elected 1891, and the first democratic gov. since 1854. In the canvass, the question of 'prohibition' was foremost; he advocated the canceling of the prohibitory law of Iowa and stringent regulation of the liquor business instead. He was renominated for gov. 1893, and was defeated.

BOII, *bō′ĭ-ī:* a Celtic people who at a very remote period seem to have inhabited either the s. part of Belgium, or a portion of France, in its immediate vicinity, whence they emigrated to Italy. Having crossed the Po, they established themselves in the territory of the Umbrians, between the Po and the Apennines, and for some hundreds of years waged a fierce war with the Romans. They were defeated at the Vadimonian Lake, B.C. 283; at Telamon, Etruria, B.C. 225, during the great Gallic war, of which they were the original cause; rushed into rebellion on hearing of Hannibal's march, joined him at the battle of the Trebia, B.C. 218, destroyed the entire army of the consul of Postumius, B.C. 216, were prominent in the revolt of the Gauls under Hamilcar, and in the destruction of Placentia, B.C. 200; but at length, B.C. 191, they were completely subdued by Scipio Nasica, who, besides killing a vast number, took from them nearly one-half of their land. At a later period, they were dispossessed of the whole, and driven across the Alps. Their subsequent history and geographical position are not very clear. Those who settled S. of the Danube were, after a century, exterminated by the Dacians; those who returned to Gaul were destroyed by Cæsar. The most important migration of the B., however, was that to the N. of the Danube, where they founded the extensive kingdom Boiohemum, which was overthrown by the Marcomanni under Marbod. But though the dynasty of the B. was thus destroyed, the kingdom retained the name Boiohemum—i.e., home of the B., whence comes the modern Böhmen, of Bohemia.

BOIL, v. *boyl* [Gael. *boile*, madness, rage: Icel. *bulla*, to bubble up; *bola*, a bubble: F. *bouillir*, to boil: Dut. *bol*, swelling: Ger. *beule*, a tumor, a boil: L. *bulla*, a bubble: *bullio*, to bubble]: to bubble as water by heat; to be converted into vapor or steam by heat; to swell; to heave; to be agitated or moved violently by any cause; to dress or cook in water. N. a tumor upon the flesh; a sore inflamed swelling; an abscess. BOIL′ING, imp.: N. the act of bubbling by heat: BOILED, pp. *boyld:* ADJ. cooked in water, as meat. BOILINGLY, ad. *-lĭ*. BOIL′ER, n. a vessel in which any liquid is boiled; that part of a steam-engine in which the steam is generated. BOIL′ERY, n. *-ĕr-ĭ*, the boiler-house in salt-works. BOILER-CRUST, the fur or deposit of lime-salts occurring in boilers when hard water is used. BOILER-IRON, or BOILER-PLATE, n. rolled iron of ¼ to ½ inch thickness, used for making steam-boilers, tanks, the skin of ships, etc. BOILER-PROVER, in *hydraulics*, a force-pump with pressure indicator, used to try the power of a boiler to resist rupture under a given stress of hydraulic pressure. BOILING-POINT, the degree of heat at which water or any other liquid bubbles up and gives off vapor or steam freely, the point in water being 212° Fahr. AT THE BOILING-POINT, exceedingly angry. TO BOIL OVER, to run over the vessel with heat, as a liquid. TO KEEP THE POT BOILING, to keep going on actively, as dancing, festivities, etc.; not to allow to flag. A BLIND BOIL, one that does not come to a head.

BOIL: a hard painful swelling of the skin. It begins as a small hard point of a dusky red color, which is hot, painful, and throbbing. This point extends, and the symptoms increase in severity, till about the sixth to the ninth day, when the B. ceases to enlarge. It is then of a conical form, with a broad firm base, and on the apex is a whitish blister which contains a little pus; this opens, and after a few days more there is discharged a core or slough of dead cellular tissue. Now the small cavity heals rapidly, leaving a white depressed scar.

Many kinds of boils have been described, but they may, like other diseases of an inflammatory nature, be divided into those which are *acute* and run a rapid course, as above described; and the *chronic*, which take three or four weeks to 'come to a head.' Boils are most common in the spring, and in young and plethoric persons, and their appearance is quite consistent with robust health. Men in training for boat-races, or others who have suddenly changed their diet and daily habits, are said to be very subject to them. In some, boils continue to succeed each other for a length of time. The immediate cause of a B. is the growth of one of the bacteria of suppuration, which are nearly always present on the skin, but are prevented from growing by the natural resisting powers of the body. Anything which produces a lessening of these powers favors the production of boils.

The treatment of boils varies with the subject of them. The intestinal canal should be cleared out by laxative medicines, and the digestive powers improved by tonics and antacids. The skin should be kept healthy by frequent washing, while the inflamed spot should be poulticed. Wet lint is a sufficient application after the core has been thrown off. If the patient chooses to submit, however, to a momentary pain, he will have the greatest, most permanent, and immediate relief from a cut carried quite through the boil. The tendency to frequent recurrence of boils is sometimes relieved by sulphide of calcium, and John Hunter, the great surgeon, effected a riddance of habitual boils by taking repeated doses of carbonate of sodium in milk.

BOILEAU DESPRÉAUX, *bwȧ-lō′dă-prā-ō′*, NICOLAS: 1636, Nov. 1—1711, Mar. 13; b. near Paris: poet. In 1660 he produced the fine satire, *Adieux d'un Poète à la Ville de Paris*. In 1666, he published his seven *Satires*, afterward increased to twelve, of which the eighth and ninth are considered the best. In these satires, B. even ventures to castigate the *coryphæi* of the world of letters—Chapelain, Cotin, Scudery, etc. To his honor, however, it must be said that malice does not once animate his pen; he is always pleasant and gay, never cruel. His contemporaries are his laughing-stocks, not his victims. From 1669–96 appeared his *Twelve Epistles*, indicating a ripened genius. The versification has more ease and grace; the style, a quicker movement and a firmer consistency; the thoughts are more vigorous, and more strictly concatenated; every-

where are greater truth, color, and energy. The one addressed to Racine, who, with B., filled the office of royal historiographer, is reckoned among the finest. In 1674, B. published *L'Art Poétique*, accompanied by a translation from the Greek of *Longinus on the Sublime*, and the greater part of *Lutrin*. These are by many French critics considered his *chefs-d'œuvre*. The first is indeed exquisite, and is copiously imitated in Pope's *Essay on Criticism*. It lays down rules for almost every species of poetry, in a clearer and more methodical manner than had ever been done before, while the whole poem is sprinkled with touches of delicate satire. The second, *Lutrin*, is a comic epic in six cantos, immensely admired by his countrymen. Besides these, B. wrote several minor pieces, in prose and in verse, such as—*Dialogue des Héros de Roman*, *Dissertation sur Joconde*, *L'Arrêt Burlesque*, and *Discours sur la Satire*. Many of his letters have been collected. Among them are 20 to Racine. The letters of B. are in general extremely valuable, as they contain a large portion of the literary history of the time. They also show his character as high-minded, generous, and pure. In fact, his impulsive disposition and imprudent warmth of heart quite contradict the common notion of what a satirist is. When Corneille's pension was ordered to be stopped, after the death of Colbert, B. hastened to the king, remonstrated against so 'barbarous a spoliation,' and threatened to resign his own, if the decree were carried into effect. He courageously denounced the persecutors of the nuns of Port Royal; expressed his admiration of Arnauld, when the latter was on the point of being arrested; extricated from pecuniary embarrassments many friends; and, through kindliness of heart, forced a reconciliation with various of his literary adversaries. An admirer of Pascal, and a friend of the Jansenists, he could yet render homage to the talents of such Jesuits as Bourdaloue, Bonhours, and Rapin; but his most intimate and cherished companions were Molière, Racine, and Lafontaine. Until 1706, B. lived much in public, but after that his bodily infirmities induced him to retire to Auteuil. B.'s influence on French literature has been immense, and, on the whole, beneficial. Voltaire proclaimed him 'the legislator of Parnassus.' When Boileau began to write, Montaigne, Pascal, Malherbe, Corneille, Molière, La Fontaine, and other eminent authors had already made their appearance; yet the people were slow to appreciate the genius of the new school, to which they preferred the previous mediocre and imitative writers. Boileau's great achievement was to cure this perversion of taste. He was the recipient of an annual pension of 2,000 francs. His admission to the French Academy did not take place before 1684, owing to his attacks upon some of the members. The best edition of his works is by Gidel (1870–3). See Deschanel, *Le romantisme des classiques* 4th series (1888); Faguet, XVII. Siecle, *Etudes littéraires* (1887); Hemon, *Cours de littérature* (1889–95); Lanson, *Boileau*, (1892); Morillot, *Boileau* (1892).

BOILER.

BOILER, in Mechanics: a vessel in which steam, usually for a steam-engine, is generated. In its simplest form, it consists of a close vessel of metal plate, having apertures for the admission of water and egress of steam, fitted with apparatus for showing the level of the water and the pressure of the steam, and in connection with a furnace, either internal or external. When water is boiled in an open pan, the temperature of the water and of the steam rising from it remains at or very near 212° F., and the tension or pressure of the steam is no more than sufficient to make its way into the atmosphere, being exactly equal to that exerted in all directions by the atmosphere itself—namely, 14.7 lbs. per sq. inch. In a close vessel, on the other hand, the temperature and pressure to which steam can be raised are limited only by the strength of the vessel or B. against bursting.

The form of a B. is determined by two considerations—strength to withstand internal pressure, and efficiency in producing steam; and the object of the designer is to combine in one apparatus sufficient strength to work safely at the proposed pressure, with such a form and arrangement as shall abstract the maximum of heat from the gases of combustion, and at the same time be suitable to all the special circumstances of the case. The globular form is that best adapted for strength, and was the earliest used. It presents to the fire, however, the minimum area in proportion to its contents, and therefore has a minimum efficiency. After spherical boilers, cylindrical ones came into use, at first set on end, afterward laid on their sides; and later on, these were furnished with internal cylindrical tubes for furnaces. Watt's 'wagon boiler' (so called from its shape) was used for many years, but being quite unfit for any but the lowest pressures, it has long been discarded; and the 'egg-end' boiler, or plain cylinder with hemispherical ends, also much used at one time, has now almost disappeared on account of its small evaporative efficiency. At present, it is quite common to use a working steam-pressure of 60-80 lbs. per sq. inch in ordinary factory boilers, and in some cases this is greatly exceeded, while the tendency to use higher pressures seems to grow yearly. Under these pressures, the only forms of boiler which can be used without heavy and expensive internal stays to prevent the danger of bursting, are the globular and the cylindrical. The former shape is rejected for the reason already given, and the latter form is used almost invariably in the construction of modern boilers, as is seen in the examples given below. The ends of the cylinders, when it is necessary to make them flat, must, of course, be strengthened by stays.

Boilers may be classified in several ways—as (1) Horizontal and Vertical; (2) Internally and externally fired; and (3) Multitubular and Tubulous. Large boilers are almost invariably horizontal, but small vertical boilers are common. They are employed in erecting plants and other situations where great length would be an

inconvenience, and often in traction-engines, where steep inclines have to be traversed, and where, if a locomotive boiler were used, one or the other end of its tubes might become uncovered, and so be burned. When moderately good fuel is used, boilers with an internal furnace are generally preferred; but where the inferior brown coal is used, as on the continent of Europe, boilers are for the most part fired externally. This is because a larger quantity of the inferior fuel is required for a given volume of steam; this involves having a much larger grate than could be conveniently arranged inside the boiler. The ordinary cylindrical boilers, with or without internal furnaces, horizontal or vertical, are built in great variety. They are the cheapest and simplest which can be made, and, if properly proportioned, have considerable evaporative efficiency. When it is necessary, however, to economize fuel, 'tubular,' 'multitubular' or multiflue boilers are used. These derive their names from the fact that in them the flame and gases of combustion are made to pass through a great number of small tubes (surrounded by the water) on their way to the chimney. The steam-generating power of a boiler depends greatly on the extent of surface which it presents to the flame, and it is obvious that a great number of small tubes present a much larger surface than one large tube occupying the space of them all. Thus, with the same heating surface, a multitubular boiler will occupy much less space than a plain one, and at the same time the efficiency of its surface is found to be greater. It is, however, necessarily more expensive and more liable to get out of order.

A common primary type of boiler for factories, etc., is that known as the *Cornish*, shown in fig. 1. It consists simply of a cylindrical shell, *a*, *a*, inclosing a much smaller cylinder, *f*, *f*, called a *flue*. The ends of the flue are open, but the space between it and the shell, which contains the water, is of course closed up and made steam-tight. The fire-grate, *d*, is in the interior of the flue, and at the end of it is a brick bridge, *c*, made so as to cause the flame to impinge on the upper side of the flue. The boiler is set in brick-work; and the flame, passing out at the back end of the flue, is made to traverse the whole length of the boiler twice through brick flues before passing away to the chimney.

The *Lancashire* boiler is very similar, but has two internal flues which is a more advantageous construction than that shown in fig. 1. The *Galloway* boiler (named from its inventor) is a modification of the Cornish, having two furnaces, joined together in one chamber just behind the bridges, and the gases are made to pass through a space considerably narrowed by side *pockets* projecting inwards in order that they may be well mixed. From this point to the back of the boiler there is just one flue, made oval in section, and crossed by a considerable number of vertical taper tubes, which form a direct communication between the water beneath and that above the flue.

These tubes (called 'Galloway tubes') both promote circulation and strengthen the flue. A common type of small marine tubular boiler is shown in fig. 2. The shell, *a*, *a*, is cylindrical, and contains one or more cylindrical furnaces; *c* is the fire grate; *d*, a brick bridge; *e*, a combustion chamber or flame-box; *f*, the tubes through which the flame passes back to the front of the boiler; and *g*,

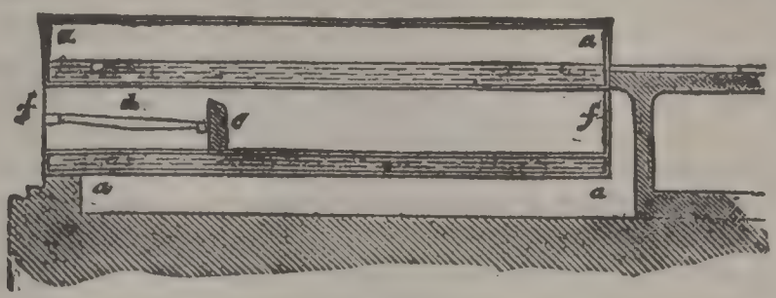


Fig. 1.

the smoke-box at the base of the funnel *h*. The line *k*, *k*, shows the ordinary level of the water in the boiler.

Another form of tubular boiler is the *Field*, shown in fig. 3. The peculiarity of it consists in the tubes, which are closed at the bottom, and hang down from the top of the fire-box over the grate bars, and contain inner tubes of much smaller diameter. The latter are intended to aid the circulation of the water, which passes down the inner

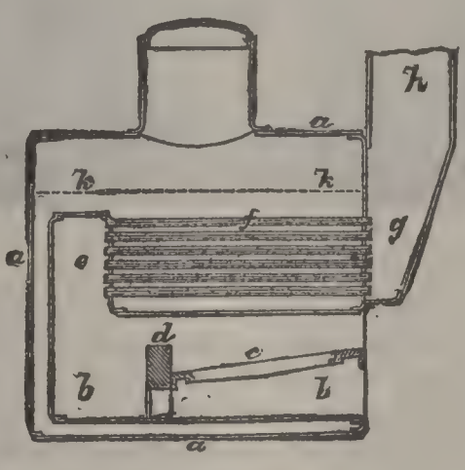


Fig. 2.

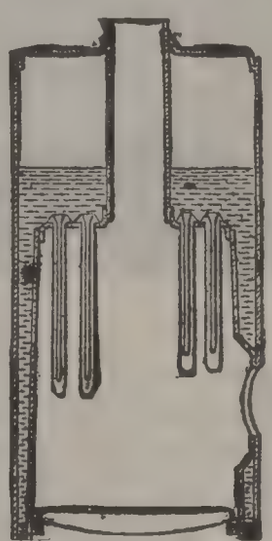


Fig. 3.

tube and up again through the annular space around it, where, being most exposed to the action of the flame, it is hottest.

The principal test of the efficiency of a boiler is the quantity of water (generally expressed either in pounds or gallons), which it will evaporate with the consumption of one of coal. Of course this varies very much with the quality of the fuel, but with good pit coal (not dross), a Cornish boiler should evaporate 6 to 8 lbs. of water per lb. coal, and a multitubular boiler, such as fig. 2, about 10 or 11 lb. per lb. coal. The best rate of combustion on the grate

varies with the construction of the boiler, from 10 to 18 or 20 lb. per sq. foot of grate surface per hour.

A water-tube B., sometimes called a 'tubulous' B., is one in which the water and steam occupy the tubes and the flame and gases of combustion circulate around the tubes within the boiler-shell. They assume a great variety of forms. Sometimes there is a cylindrical shell for the circulation of the gases through which the water-tubes pass. There are usually one or more chambers or cylinders connected with the tubes for containing water or steam. Sometimes there are chambers below for heating the feed-water, and water-tubes leading from these to one or more upper steam chambers. Sometimes the water tubes are set at an angle within a brick furnace, and more or less surrounded with bridges or plates to direct the flame and hot gases so that they will circulate around the tubes. In the Thornycroft B., as used on road-engines in England, the fuel is shoveled in centrally at the top, and descends

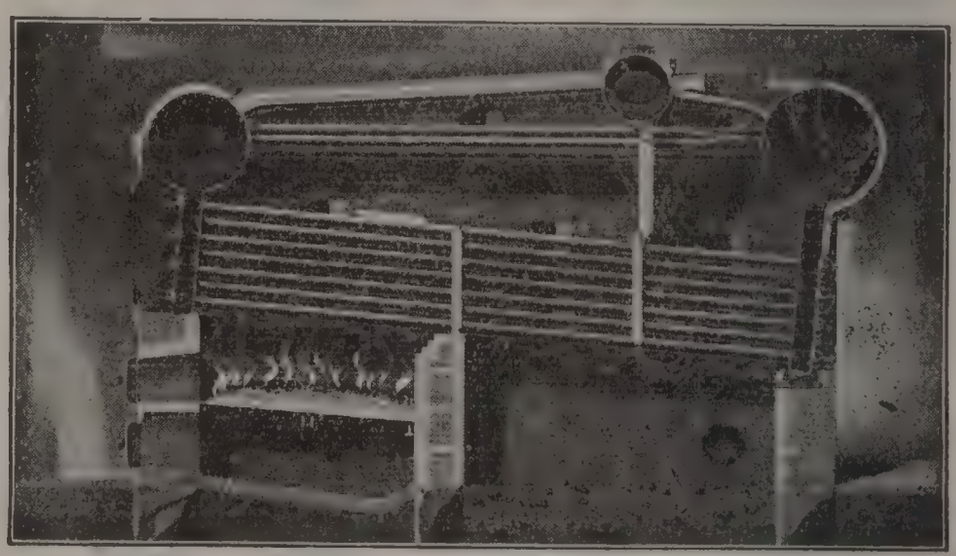


Fig. 4—Atlas Boiler.

within a circle of tubes to the furnace. The fire is under and below a water-chamber formed in the shape of a hollow ring, and connected by water-tubes with a ring-like boiler above. The flames and hot gases pass up along the tubes to the annular B. which is designed to contain steam.

In the Babcock and Wilcox B., these chambers are connected with one or more horizontal steam-drums lying lengthwise above them outside the fire-chamber, the water-level being in the drum and the tubes entirely filled with water. In other B. the water-level is below the elevated forward ends of the three upper rows of the inclined tubes, making this portion a surface for the production of superheated steam; only steam enters the drum above. Another form of B. has within the water-tubes other smaller tubes or flues through which the heated gases pass after passing around outside the outer tubes, the steam-drum and connections being also inclosed within the fire-box; this gives a large heating surface. In all these boilers there are diaphragms to make the flame and gases pass back and

forth several times over different portions of the tubes before reaching the chimney.

In the Atlas B. most of the water tubes are level, but those that connect the steam chambers at and above the center are inclined.

Closely allied to the water-tube B. is the flash-generator of the steam automobile. This is a boiler in fact though not in name. It consists wholly of coiled water-tubes and has no steam-chamber, the steam being formed in the tubes and superheated. Such a B. makes steam very rapidly, but has a small storage capacity. It receives its water from a pump, and changes it to steam, which it heats and delivers directly to the pistons of the engine's cylinders. See AUTOMOBILE.

Priming is a common difficulty connected with water-tube B. It may be defined as the carrying of water with the steam into the cylinders of the engine. This is apt to produce breakage, since water will not compress appreciably, and the piston coming back on a collection of water in the cylinder is stopped positively, often with disastrous results. An expert engineer can detect priming when it begins by the sound of hammering in the engine-cylinder, and prevent damage by draining off the water. To prevent priming a separator is used to lead the steam, passing through the B. to the cylinder, around a sharp corner, where the water particles are thrown off by centrifugal force, and collected in a trap. One form of separator consists of a double tube across the top plate of the B. One tube is within the other, and the inner tube carries the steam, while the condensed water is drawn off through small holes in the outer tube. Baffle-plates are also placed across the top of many B. to turn back the water that otherwise would flow over to the engine cylinder.

All steam B. are constructed so that the interior of the water spaces can be got at for cleaning, and large B. have man-holes through which the interior may be examined for scale or incrustation. This results from the water's depositing in the B. or tubes some of the mineral matter that is carried in solution by all natural waters. The character of the scale that forms in a B. is determined by the salts or other mineral in solution in the water. Salts of lime and of magnesia, with silica, and iron, are common; these adhere to the interior and form a hard crust that has to be scraped off at intervals. The gathering of such scale may be checked when the prevailing mineral in the scale is known. A very little petroleum in the water will reduce the tendency of lime to adhere in the scale. At the Krupp steel works in Germany milk of lime and barium chloride are found to reduce the scale produced by the minerals contained in the waters of that locality.

Steel plates riveted together and lapped at the joints are the material used in making B. shells. The strength of such plates may be determined very accurately with modern testing machines. In the ordinary upright cylindrical B.

the metal plates at the bottom over the fire-box are termed the crown-sheets, while the plates that hold the ends of the water-tubes are termed tube-sheets. Flues is the term best used for those pipe connecting with the fire and containing the flame and hot gases, while tubes is the name best applied to those pipes that contain water or steam. B. tubes are made of welded iron, welded steel and sometimes of copper. Iron and steel tubes are often galvanized inside to resist rust.

In connecting tubes with the tube-sheets the method of making tight joints consists in inserting a tube as tightly as convenient in a hole in the metal sheet, and then expanding or enlarging the end of the tube with a spreading tool until it presses firmly and solidly against the surrounding sheet. Some B. tubes are made slightly bent so that when they grow longer or shorter with changes of temperature the difference in length may be taken up by bending.

B. shells are liable to rust, which may eat away and reduce their strength. Every B. should be well drained at the base so that water may not accumulate there. Sometimes ashes allowed to lie against a B. bring about corrosion, because of the alkaline salts. The use of brass fittings on a B. occasionally has been known to set up a galvanic action at the point of contact with the steel shell, causing it to be eaten away by electrolysis.

Deterioration of B. shells is a common cause of B. explosion, and can be prevented only by regular inspections. A more common cause is allowing the water in the B. to become low, so that the metal is over-heated, that is practically red hot, and then feeding in fresh water, which turns instantly to steam, creating undue pressure. B. are commonly made of a strength to withstand from five to ten times the strain that they are likely to be subjected to under reasonable operation.

The fittings or attachments of B. are a pressure-gauge, showing on a dial at all times the steam-pressure; a glass water-gauge, which permits the water level to be seen with the eye; three or more try-cocks, which on opening permit either steam or water to blow out, thus indicating the water level; a safety valve, adjusted to blow off steam when it rises above a given pressure; a fusible plug that will melt at a certain temperature, and permit the steam to escape when the heat goes higher.

The common devices for feeding water to B. are injectors and steam force-pumps. An injector resembles an atomizer, such as is used in spraying cologne. Injectors are made with both single and double tubes, the latter being the best to feed hot water. In either case swiftly moving steam is led over the opening of a small water-tube causing a partial vacuum in the tube that creates a suction, lifting the water and forcing part of it into the B. The force-pump is a positive acting piston-pump, which is made to force water into the B., in spite of the higher pressure therein, by admitting through a tube of small diameter.

Many B. are supplied with water regulators operated on the principle of a float, which on rising to a certain high level set in operation a device for stopping the pumping of water, and when sinking below a given level set the pump in operation again. See BOILING, MANOMETER, SAFETY-VALVE, STEAM-ENGINE.

BOILING, in Cookery. One important preliminary rule in boiling rests on the fact (see BOILING—BOILING POINT) that water cannot be heated in an open vessel, or in one with the ordinary fitting lid of a cooking utensil, to a higher point than 212°. When a vessel, then, has once begun to boil, a stronger fire than is just sufficient to keep it boiling will only evaporate, or waste, the water in steam, but will not cook the food any faster; on the contrary, the outside will be rendered so hard by the quick boiling, that the interior will not be reached by the heat.

By long soaking in cold or tepid water, fresh meat loses much of its albumen and nutritive juice. When a piece of meat is to be boiled, it is necessary, for the preservation of these juices, and its consequent tenderness and nutritious quality, that the outside should be sealed up, by immersing it in boiling water, and keeping up the temperature for a minute; this closes up the pores, and coagulates the albumen of the exterior. The boiling water should then be taken off, and as much cold put in as will reduce it to a tepid state; it should then be gradually warmed until it reaches a degree *slightly* under the boiling-point, called simmering; at this point it must be kept without suffering any interruption of the heat, till the time elapses allowed for cooking the food. 'The cooking goes on through the agency of the natural moisture of the flesh. Converted into vapor by the heat, a kind of steaming takes place within the piece of meat; it is, when skilfully done, cooked by its own steam.'

To prepare meat for B., it should be trimmed, washed, and dried before it is placed in the water. As it simmers, the water should be kept well skimmed with a skimming-spoon, as frequently as any scum is thrown up, but with due remembrance of the fact, that raising the lid of the vessel lowers the temperature of the water; and the preservation of an equal degree of heat throughout the operation is of the greatest importance.

For fresh meat, 20 minutes is the allowance for each pound. The weather must also be considered: in frosty weather, or with very thick joints, extra 20 minutes should be given. Mutton loses in boiling, in 1 lb., 3½ oz.; beef, in 1 lb., 4 oz. Meat that has been salted and dried has its outer coat already sealed up; it requires, therefore, to be thoroughly washed, soaked for two hours in cold water, dried, and put to boil in cold water, gradually brought to the boiling-point, and kept simmering for a time proportioned to the size of the piece. Hams and tongues, to be eaten cold, should be allowed to cool in the water in which they have been boiled. The following is a time-table for the cooking of these meats, reckoning from the time the water boils: A ham of 16 lbs. takes 4 hours; a tongue of

16 lbs., 2 to 4 hours; a pig's face of 16 lbs., 2 hours; a piece of bacon of 4 lbs., 2 hours.

BOILING (of Liquids)—BOILING-POINT: the act of bubbling by heat—the temperature at which ebullition is maintained. When heat is applied to a vessel containing water, the temperature gradually rises, and vapor comes silently off the surface; but at a certain degree of heat, steam (q.v.) begins to be formed in small explosive bursts at the bottom and rising through the liquid in considerable bubbles, throws it into commotion. If, after this, the steam is allowed freely to escape, the temperature of the water rises no higher, however great the heat of the fire. The water is then said to *boil*, and the temperature at which it remains permanent is its *boiling-point*. The boiling-point of water is ordinarily 212°; but every liquid has a point of its own. Thus, sulphuric ether boils at 96°; alcohol at 176°; oil of turpentine, at 316°; sulphuric acid, at 620°; and mercury at 662°. The boiling-point of liquids is constant, under the same conditions, but is liable to be altered by various circumstances. Water with common salt in it, e.g., requires greater heat to make it boil than pure water. The nature of the vessel, too, exerts an influence; in a glass vessel, the boiling-point of water is a degree or two higher than in one of metal, owing to the greater attraction that there is between water and glass than between water and a metal. But what most affects the boiling-point is variation of pressure. It is only when the barometer stands at 30 inches, showing an atmospheric pressure of 15 lbs., on the sq. inch, that the boiling-point of water is 212°. When the barometer falls, or when part of the pressure is in any other way removed, it boils before coming to 212°, and when the pressure is increased the boiling-point rises. An elevation of 510 ft. above the sea-level makes a diminution of a degree; at higher levels, the difference of elevation corresponding to a degree of temperature in the boiling-point increases; but, the rate of variation once ascertained, a method is thus furnished of measuring the heights of mountains. At the City of Mexico, 7,000 ft. above the sea, water boils at 200°; at Quito, 9,000 ft., at 194°; and on Donkia Mountain, in the Himalaya, at the height of 18,000 ft., Dr. Hooker found it to boil at 180°. Boiling water is thus not always equally hot, and in elevated places many substances cannot be cooked by boiling. Under the receiver of an air-pump, the same effect is still more strikingly seen; water may be made to boil at the temperature of summer, and ether when colder than ice. In complete vacuum, liquids, in general, boil at a temperature 140° lower than in the open air. The knowledge of this effect of diminished pressure is now largely turned to account in sugar-boiling, in distilling vegetable essences, and in other processes where the substances are apt to be injured by a high temperature.—By increasing the pressure, water may be heated to any degree without boiling. Papin's Digester (q.v.) is formed on this principle. Under a pressure of two atmospheres, the boiling-point rises to 234°; of four atmospheres, it

is 294°; of ten atmospheres, 359°; of fifty atmospheres, 510°.

In a deep vessel, the water at the bottom has to sustain the pressure not only of the atmosphere, but also of the water above it. At a depth of 34 ft. the pressure of the water above is equal to an atmosphere, or 15 lbs. on the sq. inch; and thus, at the bottom of a vessel of that depth, the water must be heated to 234° before it is at its boiling-point. This principle has been successfully applied to explain the phenomena of the Geysers (q.v.).

If a small quantity of water be poured into a silver basin, heated above the boiling-point, but below redness, it will begin to boil violently, or perhaps burst into steam at once. But if the basin be heated to redness, the water will gather itself into a globule, and roll about on the hot surface, without becoming heated to the boiling-point. For the explanation of this and other interesting phenomena connected with it, see SPHEROIDAL CONDITION OF LIQUIDS.

BOIS BLANC, *boy blănk:* island of the United States, in Lake Huron, between Michillimackinac and Michigan; 10 m. long, 3 m. wide, having a light-house at its e. end.

BOIS D'ARC: see OSAGE ORANGE.

BOIS-DE-BOULOGNE: see BOULOGNE.

BOISÉ CITY, *boyz,* capital of Ada co. and of the state of Idaho; on the Union Pacific railroad, and on the Boisé river; in the Snake river valley, 45 m. s.w. from Idaho City. It is an agricultural and mining trade center, with a U. S. assay office, state capitol, library, good schools, penitentiary, and noted mineral springs supplying the city with hot water. Pop. (1890) 2,311; (1900) 5,957.

BOIS-LE-DUC, *bwâ-lĕh-dük′,* (Dutch, *'s Hertogenbosch,* 'Duke's Forest'): capital of the Netherlands, province of N. Brabant; at the junction of the Dommel and the Aa. The fortifications are greatly strengthened by the natural situation, as the surrounding country can be flooded, leaving only two roads passable. It is a clean, well-built town, about 5 m. in circumference, intersected by canals, and has a citadel called Papenbril. B. was founded 1184 by Godfrey III., Duke of Brabant. His son Henry strengthened the town with walls. B. was ineffectually besieged 1601 and 1603, but surrendered to the Dutch, 1629. In 1794, it was taken by the French; and 1814, retaken by the Prussians. Pop. (1900) 44,034.

BOISSERÉE, *bwâs-rā′,* SULPIZ: 1783–1841; b. Cologne: archeologist. A visit to Paris which he and his brother Melchior (1786–1851), with their friend Joh. Bapt. Bertram made 1803, inspired the trio with the idea of collecting and preserving the scattered specimens of early German art. The realization of this idea became the object of their lives. After many years of unwearied research, they gathered together 200 pictures, which received the name of 'the Boisserean Collection.' The King of Würtemberg having presented the brothers with a spacious edifice in Stuttgart,

the pictures were transferred thither, and skilfully arranged, according to their age and importance. This brought to light a very important historical fact, previously unknown—viz., that in the 14th c., Germany possessed a school of art based on Byzantine traditions. Great light was also thrown upon many of the Flemish masters, and especially on the influence exerted by Jan Van Eyck. The collection was divided into three sections corresponding to three historical periods—the first comprising the works of the Cologne school in the 14th c.; the second, those of Van Eyck and his disciples in the 15th; and the third, those of the German painters at the close of the 15th and beginning of the 16th c. In 1827, the collection was sold to the King of Bavaria; and in 1836 was transferred to the picture-gallery (*Pinakothek*) in Munich, whither the brothers followed it. Sulpiz left several interesting and valuable works; such as, *Monuments of Architecture on the Lower Rhine, from the 7th to the 13th c.* (Munich, 1830–33); *Concerning the Temple of the Holy Grail*, 1834; *Collection of Old Low and High German Paintings, with Notices of the Early Painters, by Sulpiz and Melchior B. and Joh. Bapt. Bertram, lithographed by J. V. Strixner* (1822–39); and a very magnificent work, entitled *Views, Plans, Sections and Details of the Cathedral of Cologne, with Restorations after the Original Plan, accompanied by Researches on the Architecture of Ancient Cathedrals*, etc. (1823–32).

BOISSONADE, *bwâ-so-nâd'*, John Francis: 1774, Aug. 12—1859; b. Paris, of a noble Gascon family: classical scholar. He was originally intended for the administrative career, but renounced it for philology, in which he had always found his favorite recreation. He soon made himself known to the critical world by his acute and learned contributions to the literary journals, was appointed prof. of Greek in the Acad. of Paris 1809, and entered on the active duties of the chair, 1812. In 1813, he was admitted into the Acad. of Inscriptions; and in 1828, he succeeded Gail as prof. of Greek literature in the College of France, His more important works are: *Philostrati Heroica* (Paris, 1806); *Marini Vita Procli* (Leip. 1814); *Tiberius Rhetor de Figuris* (Lond. 1815); *Sylloge Poetarum Græcorum* (Paris, 1823–26); *Babrii Fabulæ* (Paris, 1844); etc. He contributed in his earlier years numerous papers on philological subjects to Parisian, English, and German journals, and gave to classical study in France a powerful and still perceptible impulse by his eloquent and attractive lectures from his chair. Besides his many and laborious philological works, he won distinction as a French lexicographer and belle-lettrist, and was one of the most copious and valued contributors to the *Biographie Universelle*. He left behind him a reputation for learning almost German in its profundity.

BOISSY D'ANGLAS, *bwâ-sē' dŏn-glâ'*, François Antoine, Count: 1756, Dec. 8—1826, Oct. 20; b. St. Jean Chambre, dept. of Ardèche, France. After filling for some time the office of major-domo to the Count of Pro-

vence (Louis XVIII.), he was elected a deputy to the states-general. While a member of the constituent national assembly, he was accused of a design to change the French monarchy into a Protestant republic. During the Reign of Terror, fear of 'the Mountain' kept him quiet; but, yielding to the solicitations of Tallien and Barère, he joined the conspiracy against Robespierre. Two months after the execution of the tyrant, he was elected sec. of the convention; and shortly afterward, a member of the committee of public safety. As director of the supply of provisions for Paris, he was exposed to popular hatred and great peril during the riotous and sanguinary proceedings of the 12th Germinal and 1st Prairial in the year 3 of the Republic; but firmness and presence of mind preserved him. He was afterward pres. of the Council of Five Hundred; was called into the senate by Napoleon; and made a peer by Louis XVIII. Through all the changes of the times, he maintained his early principles. His chief writings are, *Recherches sur la Vie, les Ecrits, et les Opinions de Malesherbes*, 1819, and *Études Littéraires et Poétiques d'un Vieillard*, 1825; but, in addition to these, he published numerous essays, pamphlets, and letters.

BOISTEROUS, a. *boys'tĕr-ŭs* [Scot. *bustuous;* OE. *boistous*, violent, large; *boist*, a threat: W. *bwyst*, wild: Low Ger. *buster*, wild or fearful]: noisy; roaring; stormy; tumultuous; violent. BOIS'TEROUSLY, ad. *-lĭ*. BOIS'TEROUSNESS, n. the state or quality of being boisterous; tumultuousness.—SYN. of 'boisterous': turbulent; tumultuous; noisy; impetuous; loud; roaring; violent; stormy; furious.

BOJADOR, *boj-a-dōr'*, CAPE: headland on the w. coast of Africa, lat. 26° 7′ n., long. 14° 29′ w., forming the w. extremity of the Jebel Khal (or Black Mountains), a rocky ridge running e. into the Sahara. In consequence of its extreme flatness, and the shoreward tendency of the currents, the coast, extending n. to Cape Nun, is one of the most dangerous that mariners have to encounter, and is frequently the scene of shipping casualties. The Portuguese doubled this cape, 1433, and from them it received its name B. C., signifying 'a round cape.'

BOJANO, *bo-yâ'no:* town in the province of Campobasso, Italy, 13 m. s.w. of the town of Campobasso. It has a cathedral and ancient remains. It has suffered greatly from earthquakes, especially in 1805. Many scholars have believed it to occupy the site of the famous Samnite city of *Bovianum*. B. was captured by the Romans B.C. 311, 305, and 298. In the Social war the confederates made it their capital. Cæsar established here a military colony.—Pop. 3,500.

BOJAR: see BOIAR.

BOKER, *bō'kĕr*, GEORGE HENRY: poet: 1823, Oct. 6—1890, Jan. 2; b. Philadelphia. He graduated at Princeton 1843: studied law; was admitted to the bar, but never practiced. After several years of European travel, he pub. a volume of poems 1847, and 1848 a tragedy, *Calaynos*.

which was acted in England at the time, and was resuscitated by Lawrence Barrett in the United States 1883. During the civil war he wrote many patriotic lyrics. B. was U. S. minister to Turkey 1872–76, and to Russia 1876–79. His first vol. of poems was *The Lesson of Life* (1847); among his volumes are: *Poems of the War; Street Lyrics; The Book of the Dead.* Of dramatic works, besides *Calaynos,* he wrote *Anne Bolleyn; Leonore de Guzman; Francesca da Rimini; The Widow's Marriage.*

BOKHARA *bŏch-â'rà* (i.e., Eastland), or USBEKISTAN, *ôz-bĕk-is-tân':* vassal state of Russia in central Asia; lat. 37°–41° n., long. 62°–72° e.; bounded n. by Turkestan, e. by the Pamir, s. by Afghanistan, w. by the Kara Kum desert; about 92,000 sq. m.; reigning sovereign (1893) Sayid Abdul Ahad, who succeeded his father 1885: principal towns, with pop., Bokhara 100,000, Karshi 25,000, Khuzar, Shahr-i-Sabz, Hissar, 10,000, Charjui, Karakul, and Kermine. Since the treaty of (1873) no foreigner can be admitted into B. without a Russian passport.

Only in the neighborhood of the rivers is cultivation possible. The rest of the soil of B. is composed of a stiff arid clay, interspersed with low sand-hills. B. belongs exclusively to the basin of the Sea of Aral. It has only three rivers of any importance—the Amu or Jihun (anciently the *Oxus*), the Zar-afshan, and the Kurshi. Entering B. at Kushtuppa, the Amu flows through the country w.n.w. to the Sea of Aral. Its banks in some parts are very fertile, especially in the neighborhood of Balkh. The Zar-afshan, which rises in the spurs of the Thianshan Mountains, after a course of about 200 m. issues into the plain near Samarcand, and thence fertilizes the district (Meeankal) to the city of Bokhara. Before reaching the city, it sends out a n. branch, which, after a fertilizing course of several miles, is absorbed in the sand. The s. branch passes B. to the n., and terminates in the lake of Kara-kool, a sheet of salt water about 25 m. in circumference, connected with the Amu by irrigating canals. The valley of the Zar-afshan is the richest as well as the most populous in Bokhara. The Kurshi has a course of about 60 m. before it is lost in the desert.

The climate of B. is moderate and healthful. Its geographical position secures B. the transit-trade between Russia and the s. of Asia. The rains usually begin and end with February. Violent sand-storms are frequent, and occasion ophthalmia among the inhabitants, who are also subject to the attacks of the guinea-worm, which penetrates the flesh, causing great pain and annoyance.

Minerals are not numerous in kind. The sands of the Oxus yield gold. Salt deposits are frequent. Alum and sulphur are found in the vicinity of Samarcand, and sal-ammoniac in the mountainous districts. The other products include rice and cotton, wheat, barley, beet-root, vegetables, hemp—used only in the preparation of an intoxicating liquor called *bhang*—silk, fruits in immense abundance, and tobacco. The camel's thorn, a plant that grows luxuriantly in Samarcand and Kurshi, exudes a saccharine gum or manna, extensively used as sugar.

B. imports green tea, mostly from India, indigo, Dacca muslins, drugs, shawls, and kincobs; and exports raw silk and cotton. The religion is Mohammedan. The ameer has an army of 20,000 officers and men, of whom 4,000 are kept in the capital. All have been drilled by Russian officers and a large proportion armed with Russian rifles. The import of spirituous liquors, except for the use of the Russian embassy, is forbidden. A Russian railway extends from Charjui to Samarkand, and a telegraph line from Samarkand to the capital.

B. was conquered by the Arabs in the beginning of the 8th c., who were dispossessed, 1232, by Genghis Khan. It fell into the hands of Timur, 1303, and was taken by the Usbeks, 1505, and it has since remained under the same Turkish race. During the 18th c., the khans were characterized by the worst abominations of eastern vice and fanaticism; and Bokhara lost its pre-eminence among the khanates of Turkestan. The canals, which alone gave fertility to the country, were neglected; and large areas were again overspread by the desert; the population diminished; B. became a centre of corruption and anarchy. About 30 years ago, it was ruled by the Khan Nasrullah, a barbarous and incapable tyrant. It was he who caused, 1843, the murder of Colonel Stoddart and Captain Conolly, who went on a mission to B. Dr. Wolff, who visited the country, 1844, with a view to ascertain their fate, narrowly escaped with his life, after a detention of some months. After the capture of Tashkend by the Russians 1865 (see TURKESTAN), a religious war was preached against the Russians, and the khan, Muzaffer-Eddin, was compelled to oppose them. He was defeated at the battle of Idjar, 1866, May 20; and Samarcand (q.v.), one of the most important cities of B., was taken 1868, May. The command of the upper course of the Zar-afshan, which fertilizes the central part of B., placed the khan entirely under the power of Russia. In 1868, July 30, a peace was concluded, by which Samarcand was ceded to the czar and stipulations were entered into, favorable to Russian trade. The treaty caused great dissatisfaction to the fanatic Mussulmans of B. They rose in rebellion, placing at their head Khan Abdul Malik Mirza, son and heir of the khan. The Russians, on the intercession of the khan, aided him; and in Oct. the rebels were defeated near Karchi. The rebel prince sought refuge in Afghanistan. Shere Ali, the ameer, gave him a warm welcome, and would have invaded Bokhara had he not been restrained by Lord Mayo, the Indian viceroy, who instructed him that England could not encourage him in any attack on his neighbors. While Shere Ali was meditating an invasion of B., Abdurrahman, a nephew of Shere Ali, who had married a daughter of the khan of B., endeavored to obtain Russian aid in invading Afghan Turkestan with a Bokharian army. But, in this case, Russia opposed the enterprise (see AFGHANISTAN). During the invasion of Khiva, 1873, the khan of B. efficiently assisted the Russians, and was rewarded by a large addition to his territory from the Khivan possessions on the right bank of the

Oxus, under the treaty entered into between Russia and Khiva, 1873, July.—See *History of Bokhara from the Earliest Period to the Present Time*, by Vambery. Pop. about 2,500,000.

BOKHA'RA (honored with the title of the 'Treasury of Sciences'): famous city of central Asia, capital of the khanate of B.; on a plain, lat. 39° 48′ n., long. 64° 26′ e., in the midst of trees and gardens. It is between 8 and 9 m. in circumference, surrounded by embattled mud-walls, about 24 ft. high, with 11 gates. The houses, which are small, ill-lighted, and, with the exception of those belonging to the wealthy, uncomfortable inside, are built of sun-burnt bricks on a wooden framework; and the roofs of all are flat. The streets are ill-paved and very narrow, the widest barely sufficing for the passage of a loaded camel, while others are not more than 3 or 4 ft. across. The palace of the khan occupies an eminence of between 200 and 300 ft. in height in the centre of the city. It is surrounded by a brick wall of 60 or 70 ft. high. The area includes, besides the palace, the harem, quite embosomed in trees; various public offices, the residences of the vizier and other important state functionaries, the barracks, royal stables, etc., and three mosques. The mosques, fabulously said to be 360 in number, necessarily form one of the greatest features of Bokhara. The most imposing one occupies a square of 300 ft., and has a cupola 100 ft. high, ornamented with blue tiles. Attached to it is a tower of about twice the height, built by Timur, from which criminals are hurled. B. is celebrated as a centre of learning, and has, in addition to a vast number of schools, about 80 colleges, attended, it is stated, by about 5,000 students. As a commercial town, B. is the most important in Central Asia. B. is connected by the Transcaspian railway with Merv, and so with the Caspian ports. Pop., estimated, 100,000. See TURKESTAN.

BOKHARA CLOVER: see MELILOT.

BOLA BOLA, *bo'lâ bo'lâ*, or BO'NA BO'NA, or BO'RA BO'RA—the liquids, *l*, *n*, *r*, being interchangeable, or rather, perhaps, undistinguishable in the languages of Polynesia: one of the Society Islands, about 200 m. n.w. of Tahiti; lat. 16° 32′ s., long. 151° 52′ w.; presenting a valuable landmark in a double-peaked mountain of considerable height. It is about 24 m. round, beset by coral-reefs, some of them rising into islets. Pop. abt. 1,800.

BOLAN PASS, *bō-lân'*: a defile ascending in a generally w. direction from Sinde, on the Indus, through Beluchistan to Candahar and Ghuzni. Its entrance and its outlet are respectively 800 and 5,793 ft. above the level of the sea. The total ascent, therefore, is about 5,000 ft., which, on a length of about 55 m., gives an average of fully 90 ft. to the mile. Along the bottom of the pass descends a torrent, which the road generally follows. The route, without being impracticable, is highly defensible in a

military point of view. It is bounded throughout by eminences at least 500 ft. in height. From the outlet of the B. P. there is no fall toward the w., the spacious plateau of the Dasht-i-Bedowlut retaining the level of the upper extremity. The English government has recently built a railroad through the pass.

BOLARY: see under BOLE 3.

BOLAS, *bŏ'lâs* [Sp. *bola*, a ball]: two leather balls covered and joined by a stout narrow thong, used as a missile by S. American Indians in catching wild cattle. The hunter, holding one ball, whirls the other round his head to give it momentum, then flings it at the animal's legs, with the effect of instantly tying them together, and the animal is helpless.—If made with metal balls, the B. can be thrown far, and has been used in war.

BOLBEC, *bol-běk':* well-built town of France, dept. of Seine-Inférieure, about 18 m. n.e. of Havre, on the railway between that place and Paris. B. is on a stream of the same name, which supplies the water-power for several mills, where woolen, linen, cotton, and chemicals are manufactured. Pop. abt. 12,000.

BOLD, a. *bōld:* Dan. *bold*, intrepid: Icel. *balldr* or *ballr*, courageous, strong]: daring; courageous; fearless; confident; rude; steep, striking to the eye, as figures in a picture, or architectural features. BOLD'EN, v. in *OE.*, to make bold; to embolden. BOLD'LY, ad. *-lĭ*, in a confident manner; without timidity or fear; with spirit. BOLD'NESS, n. the quality of being bold. TO MAKE BOLD, to use freedom; to venture.—SYN. of 'bold': courageous; daring; fearless; brave; intrepid; undaunted; valiant; gallant; heroic; dauntless; manful; audacious; confident; adventurous; impudent; forward;—of 'boldness': assurance; audacity; hardihood; effrontery; impudence; shamelessness; courage; bravery; intrepidity; dauntlessness; spirit; daringness; freedom; confidence.

BOLE, n. *bōl* [W. *bol*, the belly: Icel. *bolr*, the trunk of a man's body, or of a tree]: the body or trunk of a tree.

BOLE, n. *bōl*, an OE. and less common spelling of *boll:* a measure of 4 or 6 bushels: see BOLL.

BOLE, n. *bōl* [Gr. *bōlos*, a clod or lump of earth]: in *geol.*, a term applied to friable clayey earths, usually highly colored by peroxide of iron, hydrous silicates of alumina and iron peroxide; when the *boles* become soapy in feel, they are known by the name *mountain soap*. BOLARY, a. *bō'lėr-ĭ*, pertaining to bole or clay. Bole occurs in nests and veins in basalt and other trap rocks, in Scotland, Ireland, France, Armenia, Italy, Saxony, and S. America. It feels more or less greasy between the fingers; is of different colors—yellow, red, brown, and black; has a dull resinous lustre, but a shining streak; is readily friable; and often adheres to the tongue when brought in contact therewith. *Armenian B.* has a red tint, is used often for coloring false anchovies, and is employed in coloring tooth-powders.

Lemnian Earth is the B. from the island of Lemnos, is red in color, and was at one time prescribed by medical men as a tonic and astringent medicine; and acted beneficially, no doubt, from the large percentage of oxide of iron present. The boles employed in veterinary practice in Europe are generally made from Armenian bole. The savage tribes in S. America eat B. to allay the pangs of hunger; and the inhabitants of Java use cakes made of it, under the name of *Tanaampo*, when they wish to become slender. When B. is calcined, it becomes hard; and when afterward levigated, a coarse red kind is used as a pigment in Germany under the names of *English red* and *Berlin red*. *French B.* is pale-red; *Bohemian B.*, reddish-yellow; *Silesian B.*, pale-yellow; and *Blois B.* is yellow.

BOLECTION-MOLDINGS, n. *bo-lek'shŭn-mōld'ĭngz:* moldings which project beyond the general surface of the framework of doors, gates, etc.

BOLERO, n. *bō-lār'ō* [Sp.]: Spanish national dance, mostly in the time of a minuet, with a sharp, marked, and peculiar rhythm. It is accompanied with the castanets and the guitar, and frequently with the voice; and the dancer in the movements seeks to represent the different degrees of feeling from coyness to the highest ecstasies of love. The dances of this class which are best known and most in vogue are known by such names as the Cachuca, Iota aragonesa, Madrileña, Ole, Ialeo de Jerez, etc. They are danced by one or more couples, or, as in the case of the indecent Ole, by a single female dancer. The dancers wear the Andalusian costume, partly because of all the national dresses of Spain this is the richest and most elegant, and partly because the greater number of the boleros are of Andalusian origin.

BOLESLAW, *bo'lĕs-lâv*, or BOLESLAUS, *bo'lĕs-lâ-ûs*, I., surnamed THE BRAVE, King of Poland: d. 1025; son of Mieczislaw, and his successor, 992. He commenced by dispossessing his brothers, who had received part of the duchy, instituted very severe discipline among his troops, and succeeded in making conquests in different directions, notably in Prussia. He was the first ruler of Poland that bore the royal title. He crowned himself, 1001. Pope Sylvester II., who recognized in him an ardent propagator of Christianity, hastened to recognize him as king. His son Mieczislaw succeeded to the throne, 1025.

BOLESLAW, or BOLESLAUS, II., surnamed THE BOLD: 1042–1090: King of Poland, son of Casimir I., whom he succeeded, 1058, in spite of the opposition of the greater part of the nobility. The multitude, being seduced by his grace and affability, received him with acclamations, and thereby won for him the crown. He carried his victorious arms successively into Bohemia, Hungary, and Russia, making conquests wherever he went. After a long siege he obtained possession of the wealthy city of Kiev, and delivered himself and his army to the most unbridled debauchery. This resulted in the breaking up of

his army by the desertion of his soldiers, who returned to their own country. Infuriated by that desertion, B. recruited some troops in Russia, returned to his own states, and striking indiscriminately friend and foe, inundated Poland with slaughter and blood. When the bishop of Cracow, St. Stanislaus, wished to recall him to moderation, B. was not only deaf to his appeals, but, in a fit of rage, ran to the cathedral, and slew the bishop at the altar. For that murder he was anathematized by the pope, and being deserted by his subjects, fled, and after wandering for a long time, went into a monastery in Carinthia. There, disguised and unknown even to the hour of his death, he was employed as cook for the community.

BOLESLAW, or BOLESLAUS, III., surnamed THE WRY-MOUTHED, Duke of Poland: son of Ladislaus, and his successor, 1102; d. 1139. He was a great warrior, and is said to have gained more than 40 battles.

BOLETUS, n. *bō-lē'tŭs* [L.]: genus of *Fungi* (q.v.), of the order *Hymenomycetes*. BOLETIC, a. *bō-lĕt-ĭk*, of or from. Most of the species of Boletus resemble the common mushroom and other species of *Agaricus* in form; but, instead of gills, the under-side of the cap (*pileus*) is occupied by a layer quite distinct from it in substance, and pierced by pores so as to be composed of a multitude of small tubes united together, on the inside of which the *spore-cases* or seed-vessels are produced. Some of the species are edible. *B. edulis* is much used in France, also in Germany, Hungary, Russia, etc. It is the *Ceps ordinaire* of the French markets. It grows on the ground in thin woods of oak, chestnut, or beech, sometimes in mountainous districts, in places covered with moss, heath, or grass. In moist warm summers, it sometimes appears in prodigious quantities. It has also been partially cultivated by inclosing a portion of a wood, and watering the ground with water in which the plant has been steeped, thus, in fact, sowing its minute seeds or spores. In Britain, it is comparatively rare. The cap is smooth, 6 or 7 inches across, with a thick margin, varying in color from light-brown to brownish-black; the tubes at first white, then yellow, and finally yellowish-green; the stem thick and solid, beautifully reticulated. The tubes are removed with the skin and stem, and only the flesh of the cap is eaten, which is firm, white, delicate, of agreeable smell, and is prepared like the common mushroom, dried to flavor sauces, ragouts, etc., or eaten raw with salt and pepper. It is wholesome and nutritious, and certainly to be reckoned one of the very best of the edible fungi.—*B. scaber* is another edible British species, but much inferior.—*B. æneus* is the *Ceps noir* of the French markets, and *B. aurantiacus* is the *Gyrole rouge*.

The tubes in this genus are easily separable from the pileus, and this distinguishes the species from those of allied genera. *B. edulus* is found in the U. S., but appears to be rare. A specimen measured 6 in. high, pileus 5 in. broad, stalk 1 in. thick: top grayish red, tubes yellow becoming greenish; stalk dull ochreus, finely reticulated; flesh whitish.

BOLEYN, *bûl'en*, ANNE, Queen, wife of Henry VIII. King of England: abt. 1507–1536, May 19; daughter of Sir Thomas B., afterward Viscount Rochford and Earl of Wiltshire; her mother was daughter of the Duke of Norfolk. In her seventh or eighth year, Anne went to France with Mary, sister of Henry VIII., and remained in France after Mary—who had married Louis XII.—returned to England as a widow, under the protection of Queen Claude, wife of Francis I., who was much pleased with her beauty and liveliness. It is not known exactly when she returned to England, but it is certain that she was one of Queen Catharine's maids of honor in 1527, in which year the king appears to have conceived and expressed a passion for her, to which she apparently refused to listen on other condition than that she should become his wife. Henry's religious scruples regarding the lawfulness of his marriage with Catharine, whether he had entertained them before (as is alleged) or not, certainly became much more impatient than they had hitherto been—much too urgent, indeed, for the slow decision of the court of Rome. He, accordingly, without waiting for the award of his holiness, entered privately into matrimonial relationship with Anne B., 1533, Jan., or, as some authorities have it, in Nov. previous. In 1533, Sep., the Princess—afterward Queen—Elizabeth was born. The new queen, naturally light and gay of heart, and educated at the French court, where these qualities were likely to be developed to the utmost, conducted herself toward the courtiers with an easy familiarity not customary in England for one in her position. Concerning the first two years of her married life, we have little information, only it is known that she was favorable to the Reformation, and promoted a translation of the Bible. In 1535, the affections of the king appear to have become alienated from her. According to some historians, the amorous monarch had already fixed upon a successor to Anne; others make out that his passion had nothing to do with her death, and assert that Henry contracted his unseemly hasty marriage with Jane Seymour solely at the request of the peers and privy council. If this latter statement could be thoroughly relied on, it would no doubt tell strongly against Anne, as there would then be no apparent motive for Henry seeking her condemnation if she were innocent. Between conflicting historians, one may well hesitate to decide on this point. In 1536, Feb., the queen gave birth to a son, still-born. The king now became more and more estranged from her; and her freedom of manners had given but too good grounds for her enemies to speak evil of her. On May 1, the annual tournament was held at Greenwich, in presence of the king and queen. The tilting had commenced, the challengers being Viscount Rochford, brother to the queen, and Sir Henry Norris, one of the gentlemen of the king's privy chamber. Suddenly the king rose—his outward bearing manifesting inward disturbance—left the tourney, and with a small party rode up to London, leaving the queen at Greenwich. The popular account is,

that the king's sudden departure was occasioned by the discovery of a handkerchief belonging to the queen in the possession of Norris; but the necessity for any such romantic and sudden cause of jealousy is obviated by the fact, that, in the previous week, a commission, composed of members of the privy council, had been secretly engaged in examining into charges of adultery against Anne; and two of her alleged accomplices in the crime, Sir William Brereton, a gentleman of the king's household, and Mark Smeton, a musician at court, had been already arrested. The queen remained at Greenwich that night. On the following morning, she was examined before the privy council, under the presidency of the Duke of Norfolk, her uncle, but a bigoted Rom. Catholic, and protested her innocence. In the afternoon, however, she was sent up the river to the Tower. Sir Henry Norris and Sir Francis Weston, another courtier, with Smeton, also were examined, and all at first declared their innocence of the charge imputed to them; though afterward the musician confessed to the crime. Norris, too, it is said, made a like confession; but he indignantly repudiated it the next day, on the ground that he had been entrapped into it unwittingly. In the Tower, the queen's every action and word were watched and reported on; but anything she said while a prisoner seems quite as compatible with innocence as guilt, though her words unquestionably prove her to have indulged in a dangerous levity toward the courtiers; for which, however, her French education may be held to account. Her letter to Henry, written May 6, speaks decidedly in her favor. On the 10th May, the grand jury of Middlesex found a 'true bill' on the indictment, which charged the queen with committing adultery with no less than five persons, including her own brother, Lord Rochford, and of conspiring with them, jointly and severally, against the life of the king, the adultery being alleged to extend over a period of nearly three years. On the 11th, the grand jury of Kent found a true bill likewise. On the 12th, the four commoners, Brereton, Weston, Norris, and Smeton, were found guilty, the last confessing to the charge of adultery only, the other three pleading not guilty to both charges. On the 15th, the queen and her brother were tried before 27 peers, the president being the Duke of Norfolk. They affirmed their innocence; but they were found guilty, and condemned, the queen to be burned or beheaded on the Tower green. On the 17th, Smeton was hanged, and the other four beheaded; general protestations of unworthiness by them at the hour of death being regarded by some historians as evidence of particular guilt. On the 19th, the queen was beheaded—having previously confessed to Cranmer some engagement that rendered her marriage with the king illegal—with her last words praying a blessing on Henry, who, she said, had ever been to her a good and gentle lord, but making no confession of guilt.

It is difficult, if not impossible, to form anything like a just and satisfactory estimate of the character of Anne B.;

historians, for the most part, having made her but a lay-figure upon which to hang the drapery of religious partisanship, or to display the colors of individual sympathy. That, with the courtiers, she maintained not that dignity which becomes a queen, but was unguarded in manner, and thoughtlessly free of speech, there can be no question; there is much room to doubt that she was guilty of the heinous offenses laid to her charge. A woman who resisted for years the criminal solicitations of the king was not likely to seduce systematically grooms of the chamber; nor is it at all probable that one so diabolically bad as she must have been, if the charges alleged against her were true, could be so utterly devoid of that cunning necessary to the practice of successful wickedness. Again, it seems scarcely possible that such an extensive system of conspiracy and crime could have been carried on for nearly three years without being noticed by the lynx eyes, and blown upon by the calumnious tongues, of her numerous and powerful enemies, especially if there were truth in the statement in the indictment, that her accomplices were 'very jealous of each other.' On the other hand, it appears monstrous to suppose that 70 noblemen and commoners of England, before whom the case in its various stages came, against most of whom even slander had not a word to say, should have deliberately condemned a queen and five of her associates, and their own, without conclusive evidence. In the absence of the evidence which they had before them, however, it appears that the proper verdict for history to pronounce is the intermediate one, *not proven.*

BOLI, or Boly, *bo'lē:* town of Asia Minor, pashalic of Anatolia, on the left bank of the river B., and on or near the site of the Roman Hadrianopolis, 136 m. e. from Constantinople. The town occupies an eminence at the extremity of a fertile plain. It has several mosques. There are mineral springs near, and baths much frequented by the Turks. B. is on the caravan route fron Constantinople to Erzeroum. Pop. 5,000.

BOLINGBROKE, *bŏl'ing-brûk,* Henry St. John, Viscount: 1678, Oct. 1—1751; b. Battersea: educated at Eton and Oxford, after which he travelled about two years on the continent, and in 1700, shortly after his return, married the daughter of Sir Henry Winchcomb, from whom, however, he soon separated. Up to this period, he was chiefly notable for his extreme dissipation; but having entered parliament, 1701, he devoted himself to politics, and joining the tory party, soon made himself prominent as an orator. In 1704, he was made sec. of war. This office he retained till 1708, when the whigs came into power, after which he retired from politics, and applied himself to study, but still retained great influence as the queen's favorite counselor. On the fall of the whig party, 1710, he was made sec. of state for foreign affairs. In 1712, he was called to the house of lords by the title of Viscount Bolingbroke, and in 1713, against the wish of

nearly the entire nation, concluded the peace of Utrecht. Having previously quarrelled with his old friend Harley —now Earl of Oxford, his most powerful rival—he contrived his dismissal, 1714, July, and immediately proceeded to form a strong Jacobite ministry, in accordance with the well-known predilections of his royal mistress, whose death, however, a few days after, disconcerted his dangerous and unprincipled schemes. The accession of George I. was a death-blow to his political prospects. Aug. 28, he was deposed from office; in 1715, March, he fled to France; and in Aug. was attainted. For some time he held the office of sec. of state to the Pretender; but his restless and ambitious spirit yearned for the 'large excitement' of English politics. His efforts to obtain a pardon were not successful, and he retired to a small estate which he had purchased near Orleans. In 1718, his first wife died, and, 1720, he married the rich widow of the Marquis de Vilette. A judicious use of this lady's wealth enabled him to return to England, 1724, Sep. His property was restored to him, but he was never permitted to take his seat in parliament. He therefore betook himself to his villa at Dawley, near Uxbridge, where he occasionally enjoyed the society of Swift, Pope, and others of his old friends with whom he had corresponded in his exile, and where he diversified his moral and metaphysical studies by his attacks on the ministry in his periodical the *Craftsman*, in which the letters forming his *Dissertation on Parties* first appeared. In 1735, finding his political hopes clouded forever, he went back to France, in deep chagrin, and continued there till 1742. During his second residence abroad, he wrote his *Letters on the Study of History*, in which he violently attacked the Christian religion. He died after a long illness. His talents were brilliant and versatile; his style of writing was polished and eloquent; but his fatal lack of sincerity and honest purpose, and the low and unscrupulous ambition which made him scramble for power with a selfish indifference to national security, hindered him from looking wisely and deeply into any question. His philosophical theories are not profound, nor his conclusions solid, while his criticism of passing history is worthless. He was one of those clever, unscrupulous men who forget that God has something to do, as well as themselves, with the government of this world. B.'s collected writings were published by Mallet (5 vols., Lond. 1753–4).

BOLIS, n. *bō′lĭs* [Gr. *bŏlis*, a missile, a meteor; *bolĭdos*, of a missile: L. *bŏlis*, *bolĭdis*—from Gr. *ballo*, I throw]: a fire-ball passing through the air followed by a train of light; also Bollide, n. *bŏl′līd*, a fire-ball; an aërolite.

BOLIVAR, n. *bol′ĭ vėr*, sp. *bō-lē′-vâr*, one of the nine states which compose the federal republic styled the United States of Colombia. It borders on the Caribbean Sea, and lies between the states of Panama and Magdalena. Area, 21,345 sq. m.; capital, Cartagena; principal commercial centre, Barranquilla. Pop. estimated 300,000.

BOLIVAR: city: see ANGOSTURA.

BOLIVAR, SIMON (named *El Libertador*, for having rescued S. America from the Spanish yoke): 1783, July 25—1830, Dec.; b. Caracas; descended from a noble and wealthy family. Having studied law at Madrid, he travelled extensively on the continent, married, and returned to his native country, where his wife soon died. He again visited Europe, and in 1809 the United States, from which he returned with the determination to free his country from foreign despotism. Arriving at Venezuela, he at once associated himself with the patriots there; and after the insurrection of Caracas, 1810, Apr. 19, he was sent to London with a view to interest the British cabinet in their aims. The British government, however, declaring its neutrality, B. speedily returned, and fought under General Miranda in several successful engagements. The Spaniards having again obtained possession of Venezuela, B. fled to Curaçoa. He did not, however, remain long inactive. Sympathized with by the republican president of New Granada, he raised a force of volunteers; defeated the Spaniards several times, his army increasing with each victory; and, 1813, Aug. 4, entered Caracas as a conqueror, was hailed as the liberator of Venezuela, and made absolute dictator in all civil and military affairs. After defeating the Spaniards in several engagements, he was himself worsted at the battle of La Puerta, and again in Aug. at San Mateo, where he had a narrow escape. He now went to Cartagena, and afterward to Kingston, in Jamaica, where an assassin, hired by the Spaniards,tracked his steps, but, by mistake, murdered his secretary. Having visited Hayti, and assembled there the insurgent refugees, he landed with them on the island of Margarita, 1816, Dec., where he convoked a congress, instituted a government, proclaimed the abolition of slavery, and immediately manumitted his own slaves. The following two years were marked by successes over Morillo. In 1819, Feb., a congress was opened at Angostura, and B., chosen president, was armed with the power of dictator. Having conducted his forces over the almost impassible Cordilleras to New Granada, he achieved the victories of Tunja and Bojaca, and soon afterward declared New Granada united with Venezuela as a republic, under the name of Colombia. The office of president was conferred upon him. 1822 saw the new republic completely cleared of royalist troops, and B. was summoned the same year to help the Peruvians, and was named dictator of Peru. After two years' fighting, the Spaniards were driven from Peru also.

B. now made a tour through the southern provinces of Peru, where he was hailed with every demonstration of rejoicing. The name of the country was changed in his honor to Bolivia (q.v.), and a million of dollars was given him, which he devoted to the liberation of 1,000 slaves. The Bolivian code was adopted by Bolivia, 1826, Dec., and in the following year by the congress of Lima, where B. was made pres. for life. In the mean time, dissatisfaction pre-

PERU AND BOLIVIA.

SCALE OF STATUTE MILES.

0 50 100 200 300

Copyright, 1905, by Rand, McNally & Co.

vailed in Colombia, to which he returned, and notwithstanding some dissent, was confirmed in the presidency, 1826, and again, 1828. About this time a conspiracy threatened his life, but was suppressed by the execution of the leaders and the banishment of 70 accomplices. Meanwhile, his famous code was renounced in Peru, and B. was ejected from the presidency. In 1829, Venezuela separated itself from the republic of Colombia, which was generally disturbed by faction, and B.'s ambition was loudly denounced. B. accordingly laid down his authority, 1830, Jan., notwithstanding earnest entreaties to retain it, and retired, in failing health, to Cartagena. The congress of Bogota voted him a pension of 30,000 piastres, and awarded him the thanks of the Colombian people. He died at San Pedro in Dec., having, shortly before his death, written a farewell address to the people of Colombia, in which he vindicated his character from the aspersions that had been cast on it, and complained bitterly of ingratitude. The war of liberation, and the peculiar elements with which he had to deal, compelled him to assume dictatorial power; but there is no proof that he was ever insincere in his devotion to liberty. His property was mainly devoted to the service of his country. He has been described as the Washington of S. America. Like other great men, he was more correctly estimated after his death. By a resolution of congress, New Granada, 1842, his ashes were removed with great pomp from Santa Marta to Caracas.

BOLIVIA, *bo-lĭv'ĭ-a*, Sp. *bō-lēv'yâ*, republic of S. America, formerly called Upper Peru, and a part of the viceroyalty of Buenos Ayres; named after Simon Bolivar (q.v.); lat. 8°–23° s., long. 57° 30′–73° w.; bounded n. and e. by Brazil, s. by Argentina and Chile, and w. by Peru and Chile. The area and pop. by the census of 1900, Sept. 1, were as follows:

Territories and Departments.	Area, English sq. m.	Pop.	Territories and Departments.	Area, English sq. m.	Pop.
National Ter....	268,861	31,883	Chuquisaca ...	36,943	196,434
La Paz.....	75,742	423,800	Tarija.....	53,047	77,887
El Beni.....	142,735	25,119	Litoral.... ..	35,783	49,820
Oruro.....	26,748	86,081	Gran Chaco....	45,838	100,000
Cochabamba....	32,622	326,163			
Santa Cruz.....	197,688	209,855	Total.....	983,982	1,852,657
Potosi.....	67,975	325,615			

The aboriginal element of the pop. is much the most important.

Hydrographically, the country is unique. What, till 1883, was its maritime territory (the depts. of Atacama and Mejillones, now Chilian) is mainly the desert of Atacama, a sandy waste. Again, the plateau, chiefly Bolivian, of Titicaca, shut out from either ocean, loses its drainage in the Lake of Paria. Lastly, the region e. of the Andes is a cradle at once of the Plata and the Amazon, gathering for the former the Pilcomayo and the Paraguay, and for the

latter the Beni, the Mamore, and the Guapai. In each section of B. the hydrography may be said to be a clue to the rainfall. On the almost riverless shore of the Pacific the air is nearly as dry as the earth; e. of the mountains, the trade-wind vapors from the Atlantic are copious enough to feed, and to flood, the parent streams of the mightiest rivers on the globe; and within the valley of Titicaca (minimum height 12,441 ft.) the clouds barely supply the comparatively scanty evaporation. In temperature, B., almost entirely tropical, may claim to embrace all the zones in the world. Each section, except the sandy wastes on the Pacific, has its peculiar vegetation. The Andes yield a coarse grass for the guanaca, llama, alpaca, and vicunha. The table-land of Titicaca is fertile, but is remarkable for its mineral productions. The silver mines of Potosi, after yielding 3,000 millions of dollars, are believed to be inexhaustible (annual silver product of B, over $4,000,000); while gold, lead, tin, salt, sulphur, nitre and copper are abundant. B. abounds in the finest supply of india-rubber. Other products are cocoa, cinchona and coffee.

The constitution of B., as founded by Bolivar, has been subjected to many modifications. In its present form, promulgated 1880, Oct. 28, it vests the executive authority in a pres., elected for 4 years by a direct popular vote. The pres. is aided by two vice-presidents and a ministry controlling five depts.: foreign relations and worship, finance and industry, govt. and colonization, justice and public instruction, and war. The legislative authority is in a congress of two houses, a senate of 16 members and a chamber of 72 deputies. The judicial power, is vested in a supreme court, 9 dist. courts, and numerous courts of local justices. The elective franchise is extended to all persons who can read and write. The seat of govt. is changed frequently; 1889 it was at Chuquisaca or Sucre; 1892 at Oruro; 1893 at Chuquisaca; and is now at La Paz.

The state religion is the Rom. Cath.; but all other forms are permitted. Education is free in primary depts., and nominally compulsory. Besides the public schools there are 7 universities with faculties of law, theology, and medicine; a military school, and 3 schools of arts and trades.

As B. has no seaboard, its foreign trade is carried on through Chile, Peru, and Brazil. Govt. expenditure exceeds revenue, and B. has a large national and foreign debt.

B. 1018–1524 formed a part of the Inca empire of Cuzco; 1780 the Spanish dominion was established; 1825, a congress declared the country an independent republic; 1835, B. invaded Peru and annexed a part of its territory; 1839, B. was defeated by Chile; 1866, it joined the alliance of Peru, Chile, and Ecuador against Spain; and 1879–93 was engaged as an ally of Peru in a war against Chile, in which it lost its seaboard territory. It has suffered from numerous internal revolutions, the last one occurring in 1899.

BOLKHOV, *bŏl-kŏv′:* ancient town of Russia, govt. of Orel. B. is built chiefly of wood, and has more than 20 churches. It manufactures gloves, hosiery, leather; and trades in tallow, hemp, hides, and oil. Pop. (1903) 26,265.

BOLL, n. *bōl* [Dut. *bolle*, a head: W. *bul*, the husk that incloses the seed of flax: Dan. *bulne*, to swell—see BOLE 1 and BOLLED]: in *Scot.*, an old measure of capacity of four imperial bushels, or half a sack; in country transactions the *boll* is reckoned at 140 lbs., but the *boll* differs in some places; a *boll* of oats is equal to 6 bushels. In *bot.*, the pod or capsule of a plant: V. to form into a pericarp or seed-vessel. BOL′LING, imp. BOLLED, pp. *bōld*, had seed-vessels or pods formed.

BOL′LANDISTS: an association or succession of Jesuits by whom the *Acta Sanctorum* (q.v.), or Lives of the Saints of the Christian Church, were collected and published (1643–1794). They received their name from JOHN BOLLAND (1596–1665; b. in the Netherlands), who, with the help of Gottfried Henschen, edited the first 5 vols., containing the month of January, in 2 vols., pub., 1643, and the month of February, in 3 vols., 1658. The project had been undertaken by a Flemish Jesuit, Heribert of Rosweyd, and on his death in 1629, his collections were intrusted to Bolland, who established himself in Antwerp, opened a correspondence all over Europe, and associated young men of his order with himself in the work. The abolition of the order of Jesuits in 1773 caused the removal of the Bollandist Soc. to the monastery of Coudenberg, in Brussels, till the persecutions under Josephine II. brought about its dissolution. In 1789, the abbey of Tongerloo, in Brabant, took up the colossal task of carrying on the *Acta Sanctorum;* but scarcely had the 53d vol. appeared, 1794, May, when the French occupation put an end to the work. It was not till 1837 that a new Bollandist association of Jesuits was formed, under the patronage of the Belgian government; and continued the publication of this great work.

BOLLARDS, n. plu. *bŏl′lărdz* [Icel. *bolr*, the trunk of a tree]: large posts set in the ground, at each side of the docks, to lash and secure hawsers for docking ships.

BOLLED, a. *bōld* [Dan. *bulne*, to swell; *bullen*, swollen: Icel. *bolgja*, to swell]: swollen; puffed up: see BOLL.

BOLLINGS, n. plu. *bōl′lĭngz* [see BOLE 1]: bollard-trees topped and stripped.

BOLO, n. *bō′lō:* a weapon like a cutlas used by the Filipinos.

BOLOGNA, *bō-lōn′yâ:* province of the kingdom of Italy, formerly one of the delegations of the Papal States. It is bounded n. and e. by the provinces of Ferrara and Ravenna, and w. and s. by those of Modena and Florence; area 1,374 sq. m. Sloping gradually up from the plains of Lombardy in the n., its surface becomes mountainous in the s., which is traversed by offsets from the Apennines.

B. is well watered, and the streams are extensively used in the irrigation of rice-fields. It is very productive, yielding corn, wine of middling quality, olive-oil, fruit, vegetables of all kinds, hemp, flax, and saffron. Silk-worms are reared in great numbers. Marble, chalk, and gypsum are the mineral products; hemp, rice, and silk the principal articles of trade. Pop. (1901) 527,367.

BOLOGN'A: one of the most ancient cities of Italy, beautifully situated on a fertile plain at the foot of the lower slopes of the Apennine Mountains, lat. 44° 30′ n., long. 11° 21′ e. It is inclosed by a high brick wall, some 5 or 6 m. in extent, but without fortifications; the canal of Reno intersects it, and, on either side, the rivers Reno and Savena sweep past its walls. B. was, next to Rome, the most important city of the Papal States. The streets in the newer parts of the city are spacious and well paved, with rich and varied colonnades, affording shelter alike from sun and rain; in the older portion, the streets are narrow, crooked, and dirty, and the arcades correspondingly low and gloomy. The city is adorned with many fine palaces of the nobility, rich in fresco-paintings by the great masters. Pre-eminently worthy of notice is the Piazzo Maggiore, 'the Forum of B. in the middle ages,' which includes, among other fine buildings, the Palazzo Maggiore del Pubblico, and the Palazzo del Podestà. Among the fine frescoed rooms and galleries of the former, that of the Sala Farnese is the most imposing; the latter is interesting as having been the prison and death-scene, 1272, of Enzius, the son of the Emperor Frederick II., and also as containing the archives of the city. The great feature of B., however, is its religious edifices, remarkable both for the beauty of their architecture, and for the abundance and splendor of their art-treasures. It has more than 70 churches, the most remarkable of which are San Stefano, rich in relics, ancient tombs, and Madonnas, Lombard architecture, and Greek frescoes of the 11th and 12th c.; San Petronio—which, though unfinished, is the largest church in B.—a noble specimen of Italian Gothic, with a meridian traced on the floor by the astronomer Cassini, and numerous splendid bas-reliefs by Jacopo della Quercia and Tribolo, as well as masterpieces by other artists both in sculpture and in painting; San Domenico, with works by Michael Angelo and Niccolò di Pisa, and many other eminent sculptors—and paintings and frescoes by Guido, Francia, Lodovico Caracci, Marchesi, Simone da Bologna, Colonna, and others; and the cathedral dedicated to St. Peter, also rich in works of art, and interesting historical associations, which, indeed, cluster around all the structures mentioned. In the centre of the city are two remarkable leaning towers, constructed about the beginning of the 12th c.; the taller, the Asinella, has a height of 256 ft., with, in 1706, an inclination of 3 ft. 2 inches. In 1813, a careful measurement showed that this inclination had slightly increased. The other tower, the Garisenda—alluded to in the 31st canto of

Dante's *Inferno*—has an elevation of 130 ft., with a lean of 8 feet. The Univ. of B. is said to date its origin from the 5th c., when it was founded by Theodosius II., and to have been afterward restored by Charlemagne. It was not, however, until the 12th c., when it was founded anew by Irnerius or Wernerus, that it attained celebrity. Its reputation during that century was so great, chiefly on account of its school of jurisprudence, that students from all parts of Europe were attracted to it. In 1262, the number receiving instruction is stated to have been 10,000, and it was found necessary to appoint professors specially for the students from each country. The univ. is also celebrated as the first school for the practice of dissection of the human body, as well as for the fact that for centuries learned female professors have prelected within its walls. The famous linguist, Cardinal Mezzofanti, was a prof. here. Though the number of students is now comparatively small, the Univ. of B. still hold a first place among Italian educational institutions. Medicine is now the principal study. The univ. library contains 200,000 vols. and 6,000 MSS., 20,000, vols. having been presented by Benedict XIV. Many of the books are very rare and valuable. In the church of San Domenico there is a large public library accessible on holidays, when all others are closed. The Accademia delle Belle Arte is particularly rich in the works of those native artists who founded the far-famed Bolognese school of painting, and it has also some fine specimens of other schools. Besides being the birthplace of those painters that have made its name illustrious, B. gave to the pontifical chair Honorius II., Lucius II., Gregory XIII., Innocent IX., Gregory XV., and Benedict XIV.

B. has some important manufactures, including silk goods, velvet, crépe, wax candles, musical instruments, chemical products, paper, and sausages.

B. owes its origin, which is said to be much earlier than that of Rome, to the Etruscans, by whom it was called *Felsina*. It afterward fell into the hands of the Boii, from whom it passed to the Romans, who made it a colony, under the name of *Bononia* (B.C. 189). In A.D. 53, it was nearly destroyed by fire, but was restored by Claudius. After the fall of the Roman empire, it passed into the hands of the Longobards, from whom it was taken by the Franks. Charlemagne made it a free city, and its independence was confirmed by a charter from Henry V., in 1112, which also invested the citizens with the choice of their own judges, consuls, and magistrates. The feuds of the Guelph and Ghibelline factions led to the downfall of the republic, and the supremacy of the papal see, B. being made a delegation in 1513. In 1796, B. was taken by the French, and was constituted the chief town of the Cispadane republic; and afterward, when the Kingdom of Italy was established, cap. of the department Del Reno. It reverted to the pope, 1815. After that time, B. made several efforts to throw off the authority of the pope. One,

in 1831, was successful, but the papal authority was restored in the following year. In 1848, the Austrians attempted to obtain possession of B., but were repulsed. In the following year, however, they succeeded in capturing the city after a siege of ten days. B. was then, like the rest of the Romagna, declared to be in a state of siege, and was made the headquarters of the Austrian second Italian corps. From the commencement of the Italian campaign of 1859, the Bolognese gave an active sympathy to the national cause; and long before the peace-negotiations at Zurich had been brought to a close, they had intimated their intention of placing themselves under the rule of Victor Emmanuel, as a part of the new kingdom of Italy. Notwithstanding the menaces of the Vatican, they persisted in their resolve; and when the question of 'Annexation to Piedmont, or separate government,' was submitted to the universal vote of the people, 1860, March, the votes for annexation were 1,000 to 1. Pop. (1901) 152,000.

BOLOGNA, Giovanni da: 1524–1608; b. Douai: Flemish sculptor and architect. Impelled by an irresistible inclination to the study of art, he first took some lessons from one of his countrymen, then went to Rome to copy the masters. Michael Angelo had then reached the zenith of his fame, and from him B. received some counsel, and perhaps lessons. After a stay of two years B. started to go home, but stopped at Florence, where he established himself permanently, and rose to such eminence that his only superior was Michael Angelo. His masterpieces are almost innumerable. In his youth he executed a *Neptune* and four *Sirens* to adorn the public fountain of Bologna. In exchange for these marvels of his chisel he demanded a spouse, and a name—*Giovanni Bologna* (instead of John of Douai)—which he rendered illustrious.

BOLOGN'A PHI'AL, or Philosophical Phial: a short, thick, narrow glass vessel, close at one end, and open at the other, which the glass-blower prepares from each pot of metal before employing it in the fashioning of tumblers, glasses, bottles, etc. See Glass. It serves the purpose of enabling the glass-manufacturer to judge of the color and other conditions of the fused glass or metal; and as the jar is not subjected to annealing, it is very friable, and a small angular fragment of any mineral allowed to drop into it at once causes it to fly in pieces. It is remarkable, however, that a B. P. will bear a very heavy blow on the outside without being fractured.

BOLOGNA-SAUSAGE, n. [It. *salsiccia di Bologna*]: a large sausage made of bacon, veal, and pork suet, chopped fine and inclosed in a skin.

BOLOGN'A STONE: old popular name of a radiated variety of heavy spar or sulphate of barium (see Baryta), found near Bologna, which is phosphorescent in the dark. It has been called also Bologna Phosphorus; but this name more strictly belongs to it when calcined, pulverized, and

made into little cakes with gum-water. These, after being exposed to a vivid sunlight, are very phosphorescent, either in the air or under water.

BOLOGNESE SCHOOL OF PAINTING, *bo-lōn-yēz':* founded after the other Italian schools of painting, thence altogether eclectic. It was sometimes called also the Eclectic or Lombard school. Its aim was to unite the best qualities of each of the great masters, combined with the study of nature. It was founded by the Caracci (q.v.) in the beginning of the 17th c. Among the forerunners of the Caracci was Franco, the Giotto of his school, and founder of the Bolognese style of the 14th c. Many of the fading works of himself and his disciples may be seen in the Church di Mezzaratta, a gallery, so to say, of ancient paintings, which is to the Bolognese what the Campo Santo at Pisa is to the Florentine school. Lippo Dalmasio was, at the dawn of the 16th c., the most prominent name. Guido particularly lauded the purity and grandeur of his expression, and the holy feeling infused into his subjects. Francesco Francia, Nicolo dell' Abbate, and Pellegrino Tibaldi are other famous names. The Caracci combined to introduce a new style, and claimed that nature should be taken as a type and pattern, as far as practicable. Among their numerous disciples were Domenico Zampieri (called Domenichino), Guido Reni, Lanfranc, Lionella Spada, Cavedone, Tiarini, Guercino, and Carlo Cignani. Their style was for a time prevalent, but during the present century, it has lost part of its ancient fame.

BOLOR-TAGH, *bō-lŏr'tâg':* supposed lofty mountain-chain of central Asia, extending from lat. 35° to 45° n., and from long. 70° to 75° e., which was said to divide Turkestan (q.v.) into an e. and w. portion. It was described as being connected with the Thian-shan range and others farther n., as well as with the Hindu Kush on the s. Recent explorations have shown, however, that no such range exists, and that all that corresponds to it is a lofty mountainous region which sinks abruptly down on the e. side, to the relative depression known as the Western Gobi or the Tarim Basin. See PAMIR.

BOLSENA, *bŏl-sā'nâ:* Italian town, province of Rome, about 20 m. n.n.w. of the town of Viterbo. It is on the n. shore of the Lake of Bolsena (*Lacus Volsiniensis*), on the road from Florence by Siena to Rome. It has now little more than 2,000 inhabitants; but in early ages it was a place of great importance, being one of the 12 Etruscan cities, under the name of Volsinii. When finally subjugated by the Romans (B.C. 280), as many as 2,000 statues are said to have been taken from it; but, though this is doubtless an exaggeration, we may gather from it that the Volsinians had high repute for wealth and artistic skill. The Romans razed the Etruscan city to the ground, but built another in its place, which, however, is not much celebrated in history, except as the birthplace of Sejanus, the favorite and minister of Tiberius. In later ages,

according to the traditions of the Rom. Cath. Church, a doubting Bohemian priest was here convinced of the truth of the doctrine of transubstantiation, by witnessing the flow of blood from the Host he was consecrating; and in commemoration of this supernatural occurrence, Urban IV. instituted the festival of the Corpus Domini. Raphael has immortalized the incident. Half a mile from B. are a few traces of the Etruscan city, and many fragments of the Roman one remain. The Lake Bolsena is a fine expanse of water about 10 m. long and 8 broad, but its shores are very unhealthful in the summer season. The Marta river carries its waters into the Mediterranean. It has two islands, Bisentina and Martana, favorite autumnal retreats of Pope Leo X.

BOLSTER, n. *bōl′stėr* [AS. *bolster*, a cushion: Dut. *bolster*, the chaff of corn: Icel. *bolstr;* Ger. *polster*, a cushion: Sp. *bulto*, and *bolsa*, a bag, a swelling—*lit.*, the materials of which a bolster is made]: along pillow or cushion for laying the head on in bed; a pad for support; a quilt; a tool for punching holes and making bolts: V. to support; to hold up. BOL′STERING, imp. BOL′STERED, pp. *-stėrd.* BOL′STERER, n. *-stėr-ėr*, one who.

BOLSWARD, *bŏls′vârt* (Lat. *Bolverda*): old town in the Netherlands, province of Friesland, 15 m. s.w. from Leeuwarden. It is surrounded by a high earthern wall and broad canal. The church of St. Martin, in the Gothic style, is the largest and handsomest in Friesland. There are several benevolent institutions, and a grammar-school. The trade is chiefly in butter, cheese, and cattle. Shipbuilding, tanning leather, making brick and coarse pottery, spinning worsted, carding wool, etc., are the principal industries. Pop. (1902) 6,500.

BOLT, n. *bōlt* [mid. L. *bolta*, a javelin: Ger. *bolzen*, a crossbow bolt: Swiss, *bolz*, an upright beam on another: F. *boulon*, a big-headed peg of wood: Dut. *bult*, a nob or hump]: a broad-headed peg to fasten one object to another; an arrow; a dart; a small round bar of wood or metal; a stream of lightning; a meteoric stone: in *ship-building*, a small round bar of metal for fastening timbers, varying from half an inch to nearly three inches in diameter, and from a few inches to many feet in length: some of the smaller are secured at the points by riveting, clinching, or fore-locking; V. to fasten with a bolt; to make secure; to utter or throw out precipitately; to spring out or run away with swiftness; to fly from justice or pursuit. BOLT-AUGER, an auger used by ship-wrights in sinking holes for bolts. BOLT-CUTTER, in *mach.*, a tool for cutting off bolts; a machine for cutting the thread on bolts. BOLT-ROPE, the rope which goes round the border of a sail, and to which the canvas is sewed: it is of three kinds according to its position—*a leech* rope up the perpendicular edge of the sail, a *foot*-rope along the bottom of the edge, and a *head*-rope along the top edge. All the cordage for furling and unfurling the sail is fastened to the *bolt-rope*. BOLT′-

SPRIT—same as BOWSPRIT, which see. BOLT-UPRIGHT, perpendicular; straight upright, as an arrow. BOLT AND NUT, a metal pin having a broad head at one end, and a nut working upon a screw-thread on the other.

BOLT, v. *bōlt* [Ger. *beuteln*, to bolt meal—from *beutel*, a bag: F. *bluter;* OF. *beluter*, to bolt meal—from mid. L. *bulētārĕ*, to sift meal—from OF. *buire;* mid. L. *burra*, coarse woolen cloth]: to separate the bran from the flour by shaking the mass backward and forward in a cloth of loose texture. BOLT'ING, imp.: N. the process of separating the bran from the flour. BOLT'ED, pp. BOLT'ER, n. one who or that which. BOLT-HEAD, a matrass or receiver; a sifting apparatus; a round glass vessel with narrow-necked openings. BOLT'ING-HUTCH, *-hŭch*, the bin or tub for the bolted meal. BOLT'ING-TUB, a tub to sift meal in. TO BOLT THE BRAN, to sift out the bran; to sift and examine thoroughly. TO BOLT FOOD, to swallow food quickly without chewing it.

BOLTER: see BLOOD-BOLTERED.

BOL'TON, *bōl'ton*, (-LE-MOORS'): important English manufacturing town, in South Lancashire, on the Croal, 11 m. n.w. of Manchester. It was celebrated as far back as the time of Henry VIII. for its cotton and its woolen manufactures, introduced by Flemish clothiers in the 14th c. Emigrants from France and the Palatinate of the Rhine subsequently introduced new branches of manufacture; and the improvements in cotton-spinning of the middle of the 18th c. rapidly increased the trade of the town. Though Arkwright and Crompton belonged to B., the opposition of the working-classes long retarded the adoption, in their native town, of their inventions—the spinning-frame and the mule. B., containing more than 100 cotton-mills, is now one of the principal seats of the cotton manufacture in Lancashire. Muslins, fine calicoes, quiltings, counterpanes, dimities, etc., are manufactured. Since 1832, it has returned two members to parliament. B. parish has numerous coal-mines. There are 40 foundries and iron-works, and numerous dye-works. The town-hall of Corinthian architecture, which cost in all £166,000, was opened 1873. During the civil war the parliament garrisoned Bolton; in 1644, it was stormed by the Earl of Derby. Pop. (1901) 168,205.

BOLTON, HENRY CARRINGTON, PH.D.: chemist: b. New York, 1843, Jan. 28; d. Washington, D. C., 1903, Nov. 17. He graduated at Columbia College 1862; studied chemistry in Paris and at the univs. of Berlin, Göttingen, and Heidelberg; was instructor in quantitative analysis at Columbia Coll. 1872–77, and 1875–78 prof. of chem. in the Woman's Med. Coll. of the New York Infirmary; he resigned those posts and was (1878–87) professor of chem. and nat. science in Trinity Coll., Hartford, Conn. His most notable original investigation had to do with the action of organic acids on minerals; his doctoral thesis at Göttingen 1866 was on the *Fluorine Compounds of Uran-*

ium. It was at B.'s suggestion, and mainly through his exertions, that the 'centennial of chemistry' was celebrated 1874 at Northumberland, Penn., the home of Dr. Joseph Priestley, discoverer of oxygen 1774. In 1900 he was elected president of the Chemical Society of Washington, D. C. He wrote: *The Counting-Out Rhymes of Children, a Study in Folk-Lore* (1888); *Literature of Manganese; Students' Guide in Quantitative Analysis; The Evolution of the Thermometer,* 1592–1743 (1900).

BOLTON, Sarah (Knowles): author: b. Farmington, Conn., 1841, Sep. 15. In early childhood she showed a taste for reading, and soon developed an aptitude for mathematics and science. She graduated at the Hartford Seminary, founded by Catharine E. Beecher; and married 1866 Charles E. B., A. M., (b. Mass., 1841), merchant, author, and in recent years a popular and instructive lecturer on art, travels, etc. She became a resident of Cleveland, O., where she was much busied in charitable work. In two European tours she studied educational and social interests, profit-sharing, and the mental and moral condition of working people. For three years she was on the editorial staff of the *Congregationalist,* Boston. Mrs. B. is author of *How Success is Won* (1884); *Poor Boys Who Became Famous* (1885); *Girls Who Became Famous* (1886); *Stories from Life* (fiction 1886); *Social Studies in England* (1886); *Famous American Authors* (1887); *From Heart and Nature* (poems, half of them by her son) (1887); *Famous American Statesmen* (1888); *Some Successful Women* (1888); *Famous Men of Science* (1889); *Famous English Authors of the Nineteenth Century* (1890); *Famous European Artists* (1890); *Famous English Statesmen of Queen Victoria's Reign* (1891); *Famous Types of Womanhood* (1892); *Famous Voyagers and Explorers* (1893); *Famous Leaders Among Men* (1894); *Famous Leaders Among Women* (1895); *The Inevitable and Other Poems* (1895); *Famous Givers and their Gifts* (1896); *A Country Idyl and Other Stories* (1898); *Every Day Living* (1900); *Our Devoted Friend, the Dog* (1901); *European Artists* (1902); *Emerson* (1904); *Raphael* (1904); etc.

BOLTON, Sarah Tittle (Barrett): poet: 1815, Dec. 18—1893, Aug. 4; b. Newport, Ky.; dau. of Jonathan B. Barrett, and wife of Nathaniel B., editor of a newspaper, for which she wrote verses when she was 16 years of age. She passed two years in Geneva, where her husband was consul 1855, during which period she contributed to the American press. Certain of her poems have achieved popularity, including *Paddle Your Own Canoe,* and *Left on the Battlefield.* Her poems were collected and published 1886.

BOLTON PRIORY: built abt. 1150, for Augustinian canons; in a highly picturesque district on the river Wharfe, about 6 m. from Ilkley, Yorkshire. The remains are partly Transition Norman; of the church only the nave (restored) is perfect. The old barn of the priory is still in use, and an old gateway has been incorporated in Bolton Hall, a seat of the Duke of Devonshire.

BOLUS, n. *bō′lŭs* [L. *bolus*, a mass: Gr. *bōlos*, a lump]: a soft mass of medicine to be swallowed at once like a pill, but larger.

BO′MARSUND: see ALAND ISLANDS.

BOMB, n. *bŭm* [L. *bombus*, a humming or buzz: F. *bombe;* It. *bomba*, a bomb—from an imitation of the noise of the explosion]: a hollow iron ball filled with gunpowder and fitted with a fuse, and fired from a mortar; a stroke on a bell. BOMBARD, v. *bŭm-bârd* [F. *bombarde*—from *bombe*]: to throw bomb-shells, etc., into a town or fortified place in order to destroy it or cause its surrender: N. in *OE.*, a cannon; a barrel for liquor. BOMBARD′ING, imp. BOMBARD′ED, pp. BOMBARD′MENT, n. a military attack made upon a city, etc., or a fortified place by throwing shells into it from a distance. BOM′BARDIER′, n. *-bâr-dēr′*, a soldier in the Brit. artil. ranking above a private, versed in that department of arms which relates especially to bombs and shells, mortars and howitzers, grenades and fuses. He has learned to load shells and grenades, fix fuses, prepare composition for fuses and tubes, etc.; and on the field or at sieges, he fires the mortars. BOMB-KETCH or BOMB-VESSEL, a strong ship from which bombs can be thrown into a town of fortress from sea: see MORTAR VESSEL. BOMB-PROOF, a building sufficiently strong to resist the explosive force and weight of bombs falling vertically or nearly so: see CASEMATE: MAGAZINE. BOMBS, n. plu. old name of bomb-vessels.

BOMB: a missile which has also the names *bomb-shell* and *shell*. It is a hollow ball, usually of cast-iron, fired from a mortar or other large piece of ordnance, and filled with combustibles which work great havoc when the ball bursts by the firing. All such projectiles were formerly fired from mortars only, and there was thus a definite relation between the B. and the mortar; but since the invention of shell-guns, and other modern pieces of artillery, the name *shell* has been generally substituted for that of *bomb*. The 13-inch B., the largest size used in ordinary warfare (instances of exceptional magnitude are noticed under MORTAR), weighs about 195 lbs., with a thickness of metal varying from $1\frac{1}{2}$ to 2 inches at different parts; it bursts with about 8 lbs. of powder. The vent through which it is filled with powder is, after the filling, closed with a plug called a *fuse*, which sets fire to the powder, which at the proper moment bursts the B. into fragments. The 10-inch B., weighing about 90 lbs., is proportionably less in all dimensions than that just described; and so on for those of smaller diameters. It should be understood, however, that the above are conventional quantities prescribed and adopted more than half a century ago. Modern artillerists try experiments on bombs of various degrees of thickness, and various charges and fuses: see MORTAR and SHELL.

BOM′BA: nickname given to Francis II., King of Naples and Sicily, in consequence of his cruel bombardment of Messina, 1848, Sep., with great slaughter and destruction of buildings.

BOMBA'CEÆ: see STERCULIACEÆ.

BOMBARD, *bŭm'bard:* among the now disused engines of war: a piece of ordnance very short, thick, and wide in the bore. It differed from the Ballista (q.v.) in being worked with gunpowder instead of by mechanical force; and from the mortar, in shooting forth stones instead of iron shells. Some of the bombards used in the 15th c. propelled stones weighing from 200 to 500 lbs. each.

BOMBARDIER' BEE'TLE: name common to many species of Coleopterous (q.v.) insects of the genus *Brachinus,* of the tribe *Carabidæ* (q.v.). They have received this name in consequence of the remarkable power which they possess of discharging, for their own defense, an extremely acrid volatile fluid from the abdomen, which diffuses around them a pungent odor, and which explodes on coming in contact with the air. The larger and more brilliant species are tropical. Several small species of *Brachinus* are natives of England. The most common English species is only about four lines long. When roughly handled, it will make more than a dozen discharges in rapid succession. When the reservoir which contains the liquid is opened by dissection, it effervesces and evaporates instantaneously. It changes blue vegetable colors to red, and then to yellow; produces sharp pain when applied to the tongue; and leaves a yellow spot upon its surface, like that produced by a drop of nitric acid.

BOMBARD'MENT: attack upon a fortress or town by means of shells, red-hot shot, carcasses, rockets, etc., to burn and destroy the buildings and kill the people. A B. is most likely to be successful when the place is destitute of bomb-proof cover; or when the governor is too humane to expose the unoffending inhabitants to this dreadful ordeal; or when the population is strong enough to compel him to yield. A B. requires little engineering science; whereas to reduce a place by regular siege requires the work of engineers to direct the attack against fortifications, guns, and soldiery, leaving the inhabitants and buildings untouched. Military engineers generally regard a B. as a cruel operation; it is especially directed against the civilians and their buildings as a means of inducing or compelling the governor to surrender the place, and terminate their miseries. In a well-defended place, the soldiers, the ammunition, and the defense-works suffer comparatively little, seeing that the bombardiers aim at pitching their terrible missiles into the heart of the place. In modern times, a B. is mostly adopted as an adjunct to a siege, distracting the governor by an incessant fire of mortars day and night. At Sebastopol, for instance, the mortars fired shells into the centre of the city, to weaken the defense of the forts which were cannonaded by the siege-guns. In 1871, Jan., the Germans bombarding Paris and its forts, threw 10,000 shells daily into the place, of which 500 fell in the city itself. The B. of the forts of Alexandria by the Brit. fleet 1882, July 11, is an example of the effect of the enormous

modern shells. It was directed against the fortifications, not against the town, and the forts were silenced in 24 hours.

BOMBAST, n. *bŏm'băst* [L. *bombyx*, silk, fibre, cotton: It. *bambagia*, cotton: Gr. *bombux*, raw silk: Pers. *bandash*, carded cotton]: originally a soft loose stuff used to swell out garments; an inflated swelling style in speaking or writing. BOMBAS'TIC, a. *-băs'tĭk*, high-sounding; big and puffing without much meaning. BOMBAS'TICALLY, ad. *-kăl-ĭ*.

BOM'BAX: see SILK-COTTON TREE.

BOMBAY, *bŏm-bā'*: island of 8 m. by 3, on the w. of Hindustan, having its s. extremity in lat. 18° 57′ n., and long. 72° 52′ e. It consists of two rocky ridges, which embrace a valley so low as to require embankments against the tide. Its productions are scanty and unimportant. The rain-fall has an annual mean of 80 inches. The temperature, ranging between 70° and 100°, averages, during the year, about 80°. The climate was formerly very unhealthful; but the place has latterly been so much improved by drainage and other appliances that, in favorable seasons, the proportion of deaths is said very little to exceed that of London. In 1509, about a year before the capture of Goa, the Portuguese visited the island; and by 1530, they had made it their own. In 1661, they ceded it to Charles II. of England, as part of the dowry of his bride, the Infanta Catherine. In 1668, Charles II. granted it to the East India Company, which in 1685, transferred what was then its principal presidency to B. from Surat. The bay toward the mainland, even in its natural state, presents one of the finest havens in India, more particularly as being one of the few on the e. side of the Arabian Sea which are accessible during the s.w. monsoon. Anchoring-ground, of about 50 sq. m., available for vessels of any burden, is sheltered on the n. by Trombay and Salsette, and on the w. by B. itself and its two insular appendages—Old Woman's Isle and Colaba; and lastly, the open passage at the s., which thus makes an entering wind of the monsoon already mentioned, is narrowed on the e. by the island of Caranja. Art also has done much to aid nature. The islands on the n. and w.—all but Trombay, which, in fact, is itself inclosed—are welded into one by three causeways; while at the s. end of this continuous breakwater, the light-house of Colaba, 150 ft., high, indicates to mariners the entrance of the port along a radius of 20 miles.

BOMBAY′: city occupying the entire breadth of the s. end of the island of B., bordering both on the harbor inside, and on Back Bay outside. Next to Old Woman's Isle, which with Colaba may be regarded as a suburb, is the European town; about a mile to the n. is the much larger Black Town; and between them is the esplanade with the barracks and the railway terminus. Amid the various classes of the population, Parsees or Persians, descendants of fire-worshippers driven from their homes by

Mohammedan bigotry, rank next to the English, grade for grade, in respectability and influence. Besides the dock-yard, which covers about 200 acres, at the s.e. of the European town, the objects most worthy of note are the town-hall, the Library of the Asiatic Society, the Mint, Cathedral, and Custom-house; the Post-office, and Public Works Office; the Missionary Houses, the Elphinstone Institution, the Grant Medical College, the University, and Sassoon's High School; the Jamsetjee Hospital, and the Jamsetjee Obstetric Hospital. The city also has a Chamber of Commerce, offices of the Agra Bank, Government Savings Bank, B. Steam-navigation Co., and several insurance companies. Always favorably situated for foreign trade, B. has profited largely by the reopening of the ancient thoroughfare through Egypt, as saving more distance in proportion than any other emporium in the East, and also as being on the direct line between Madras and Calcutta on the one side, and Aden on the other. When the rebellion in the United States caused a sudden cessation of the American supplies, cotton began to be exported from B. in vast quantity; and although the re-opening of the southern ports soon checked the extraordinary activity of trade, B. was permanently benefited by the stimulus its commerce then received. It now presses Calcutta closely as the commercial capital of India. Chief articles of export are cotton, shawls, opium, coffee. pepper, ivory, and gums; chief imports, piece-goods, thread, yarn, metals, wine, beer, tea, and silk. The principal mail line to India is now by Suez, Aden, and B.; and from B., letters are sent on by rail. In 1893, Aug., the religious differences between the Mohammedan and Hindu residents in the city were intensified by the occurrence of a Mohammedan day of prayer and a Hindu holy-day on the same day. Rioting broke out and was continued a week before the military and police forces could suppress it. Pop. (1901) 776,006, of whom about 500,000 are Hindus and 160,000 Mohammedans.

BOMBAY: a presidency in British India. It has gained its present importance mainly in the present century. During 90 years, it was confined, with now and then a temporary and insignificant exception, to the island and the two rocky islets on the s. Even the adjacent islands, such as Salsette and Caranja, were acquired only in 1775—the very year in which a younger presidency, after absorbing Bengal, Bahar, and Orissa, annexed Benares. With the exception of the detached territory of Sinde, the presidency of B., reared principally at the expense of Mahratta dominion, physically divides itself into three parts: the two Concans, between the Western Ghauts and the Arabian Sea; the e. slope of the Western Ghauts; and, n. of both these divisions, the alluvial tracts toward the mouths of the Taptee and the Nerbudda. Of these three regions, the first, though in a higher latitude than the second, is by far the hottest—its temperature occasionally reaching 115°. The first two differ widely as to rainfall. In the Concans, the vapors of the s.w. monsoon, intercepted by the mountains,

have been known to yield, at three different places in the same year, 106, 130, and 248 inches; while, almost as a necessary consequence, the e. slope is generally liable to suffer from droughts. For details of the respective districts, see their titles. The administration is vested in a governor and three councilors, subject, however, to the control of the gov. gen. of India. The ecclesiastical establishment consists of a bishop of the Church of England, who has under him an archdeacon and many clergymen; and a number of chaplains of the Church of Scotland. The schools are of two classes—seminaries under the various missions, and schools managed by a board of education—the latter being by far the more numerous. The majority of the scholars use merely the vernacular tongues. The schools and colleges aided by government, or under its inspection number nearly 13,000. The Univ. of B. was founded 1857, and there are 13 colleges and 388 secondary schools. Libraries and newspapers have greatly increased. During the mutiny of 1857, the local army remained, on the whole, steady and faithful; and it was, in fact, a portion of it which, under Sir Hugh Rose, acted, if not actually the first, at least the second part in the suppression of the insurrection. It is to this presidency that the naval force for all the presidencies belongs. B. has benefited vastly from the establishment and extension of the Indian railway system. The first railway in Hindustan was opened in B. 1853. There are now five main railway lines in B., giving direct communication with Ahmedabad, Calcutta, and Madras. A cable telegraph from B. to Aden was laid 1869. Of late years, the manufacturing industries have been extremely active in B. Silk, paper, and cotton mills have been erected; and the presidency, commanding the richest cotton-fields in India, has improved to the utmost its natural advantages, by adding English machinery to its cheap labor and ready material. Government has been liberal in supplying money for public works. Govt. revenue derived from land, salt, customs, and excise, largely exceeds the expenditure. B., including Sinde, contains 123,064 sq. m., of which 66,319 are in native states; pop. 18,559,561, including the territory and city of Aden in Arabia (80 sq. m.; pop. 43,974).

BOMBAY ARMY: see EAST INDIA ARMY.

BOMBAY DUCK: see BUMMALOTI.

BOMBAZIN, BOMBAZINE, BOMBASIN, or BOMBASINE, n. *bŭm'bă-zēn'* [F. *bombasin*, a cotton stuff: L. *bomby'cĭnus*, silken: Gr. *bombux*, the silk-worm]: twilled cloth, for dresses, in which the warp is usually silk and the weft worsted, or sometimes cotton. The cloth has thus a bare look. It is rather fine and light in weight, and may be of any color; and is about 24 inches in width. The fabric, now little used, was extensively made, chiefly at Norwich, from about 1816.

BOMBERGER, *bŏm'bėr-gėr*, JOHN HENRY AUGUSTUS, D.D., LL.D.: theologian of the German Ref. Chh.: 1817, Jan.

3—1890, Aug. 10. After graduating at Marshall Coll. 1837, and at Mercersburg Theol. Sem. 1838, he entered the ministry, and 1854–70 was pastor of First Ref. Chh., Philadelphia. Thereafter, till his death, he was pres. of Ursinus Coll., Collegeville, Penn. He edited a condensation and translation (2 vols.) of Herzog's *Encyclopedia;* was editor of the *Reformed Church Monthly* 1868–95; translated Kurtz's *Handbook of Church History* (2 vols. 1860–62); and was author of *Infant Salvation and Baptism* (1860).

BOMBIC, a. *bŏm'bĭk* [L. *bombyx;* Gr. *bombux,* the silk-worm]: relating to the silk-worm. BOMBYC'INOUS, a. *-bĭs'ĭ-nŭs,* silken; of or like the silk-worm.

BOM'BYX: see SILK-WORM.

BOM JARDIM, *bōng zhar-dēng'* (Good Garden): town of Brazil, province of Ceara. Pop. 6,000.

BOM'MEL (Dutch, *Zalt-Boemel*): pleasant town in the Netherlands, province of Gelderland.

BOMMELERWAARD, *bom'mel-er-vârt:* island in Dutch Gelderland, formed by the Waal and Mass. It contains 12 parishes; is 16 m. in length, greatest breadth 6 m. Two-thirds of the people are Protestants. The district is extremely fertile, and besides other farm produce, flax and hops are largely grown. The town of Bommel and many thriving villages are on the island. Fort St. André defends it on the e., and Fort Loevesteen on the w. Pop. 19,056.

BONA, *bo'nâ:* seaport town of Algeria, province of Constantine, on a bay of the Mediterranean, lat. 36° 54′ n., long. 7° 46′ e.; known among the Arabs by the name of Beled-el-Areb. The town, divided into two parts, Upper and Lower B., is in a beautiful but unhealthful district, at the foot of a hill near the embouchure of the Sebus; is surrounded by walls, flanked with square towers, and further defended by Fort Cigogne, on the top of the hill. Since the occupation of B. by the French, 1832, the town has been much improved, and has now good bazaars, shops, markets, reading-rooms, etc.; manufactures of tapestry, saddlery, and native clothing; and a trade in wool, hides, corn, coral, and wax. A telegraph cable was laid between B. and Marseille, 1870; and there is regular steam communication with France, Algiers, and Tunis. Among the public buildings, the Rom. Cath. church and the convent of the Sisters of Mercy are most remarkable. Near B. are some scanty remains of the once famous city Hippo Regius, the favorite residence of the Numidian kings, and the episcopal seat of St. Augustine, who died here, 430. This city was probably connected with the ancient *Aphrodisium* (the present Bona) by a canal, of which the outline may still be seen in a morass. Hippo Regius, in early Christian times, was the central station of commerce and civilization in n. Africa, and was celebrated for its schools, theatre, aqueducts, palaces, and temples, afterward changed into churches and monasteries. It was

totally destroyed by the Mohammedans under the Caliph Osman, 646. Pop. of B. 32,288.

BO'NA DE'A (the good goddess): a mysterious Roman divinity, variously described as the wife, sister, or daughter of Faunus. She was worshipped it Rome from the most ancient times, but only by women, even her name being concealed from men. Her sanctuary was a grotto on Mons Aventinus, which had been consecrated to her by the Virgin Claudia; her festival, however (May 1), was celebrated not there, but in the house of the consul, inasmuch as the sacrifices were then offered up for the whole Roman nation. The solemnities were performed generally by aristocratic vestals. At this celebration, no men or boys were allowed to be present.

BONA FIDES, n. *bō'nă fī'dēz* [L. *bona*, good; *fides*, faith]: good faith. BONÂ FIDE, *bō'nă fī'dē*, in good faith; without fraud or deception; real, as 'To give moral support to any *bonâ fide* attempts to redress *bonâ fide* grievances'—that is, 'To give moral support to any attempts (in good faith) to redress (real) grievances.

BONA FIDES, *bō'na fī'dēz:* a Latin expression literally signifying good faith; entering largely into the consideration of legal questions, particularly matters of agreement, contract, damage, trusts, and other departments of the law, and in all of them it implies the absence of fraud, or unfair dealing or acting. This term, however, does not appear to occupy any formal place in English or American law. It is the foundation of many just and enlightened maxims in the Roman jurisprudence which in this respect, as in many others, has been followed by the legal system of Scotland. In the law of that country, a person who possesses and enjoys property upon a title which he honestly believes to be good, although it may be bad, is protected against the consequences of this illegal position by his *B. F.*, and he is entitled to retain the fruits or profits which he has reaped or received during his *bona fide* occupancy. But such *B. F.* ends when the possessor becomes aware of the insufficiency of his title, whether by private knowledge or otherwise. In the Scotch law, again, while *B. F.* gives no support to the parties, or either of them, in a second marriage, the first subsisting, it would, it is thought, have the effect of rendering the children of such second marriage—that is, children born while the *B. F.* continues—*legitimate*. See also CONTRACT: DAMAGE: MARRIAGE: GUARDIAN: EXECUTOR: TRUSTEE.

BONALD, *bō-nâl'*, LOUIS GABRIEL AMBROISE, Vicomt: DE: 1753–1840; b. Monna, near Milhau, in Aveyron publicist. Compelled to emigrate during the French Revolution, he joined the emigrant corps, and, when it was dissolved, removed to Heidelberg, where he employed his pen in the composition of politico-philosophic works on behalf of monarchy. His first important work, *Théorie du Pouvoir Politique et Religieux* (3 vols., 1796), was seized by the Directory. It prophesied the restoration of

the Bourbons. Having returned to France, B. was induced to accept the patronage of the Bonaparte family, and in 1808 was appointed minister of instruction. In 1815—as deputy for his department—he voted with the ultramontane or theocratic party in the *Chambre Introuvable* (q.v.), and was one of the most influential members of the chamber of deputies in abolishing the revolutionary law of divorce, against which he had written in 1806; in opposing all projects of electoral reform, the alienation of forests, the efforts for riddance of the Swiss mercenaries, the freedom of the press, etc. In 1823, he was elevated the peerage by Louis XVIII. The July revolution brought his public career to a close, as he refused to take the oath of allegiance to the new dynasty. He died at Monna. His most important writings are: *Législation Primitive* (3 vols., Par. 1802), and *Recherches Philosophiques sur les Premiers Objets des Connaissances Morales* (2 vols., Par. 1818), which have been immensely applauded by his own party. Their non-agreement with the fundamental facts of history has been proved by impartial criticism. His florid and incorrect style is often detrimental to his logic; and even his admirers must admit that his faith in papal infallibility, and his veneration of the Jesuits, were carried beyond all reasonable bounds. A complete edition of his works, in 12 vols., was published under his own supervision (Par. 1817–19).

His son, Louis Jacques Maurice B., Archbishop of Lyon, 1839, made a cardinal 1842, faithfully adhered to his father's political and religious principles: died, 1870, Feb. 24.

BONAMI, *bo-nâ-me'*, François: 1710–86; b. Nantes, France: naturalist. He was rector of the Univ. of Nantes, prof. of botany, and fellow of the Royal Medical Soc. He established at his own expense a botanical garden, where he cultivated the most curious plants. He is the author of *Florœ Nantensis prodromus* (1782–85, 2 vols.), with a supplement that appeared later; also, *Observations concerning a Girl without a Tongue, that Spoke, Swallowed, and Performed All the Other Functions depending upon that Organ.*

BONAMY, *bo-nâ-me'*, Charles August Jean Baptist Louis Joseph: 1764–1830; b. Fontenay-le-Comte: French general. He served with distinction during the campaigns of the Republic and of the Empire; and covered himself with glory at Marengo, where he was wounded, at Smolensk, where his brigade was almost annihilated, and at Moscow, where he received twenty wounds made by the bayonet. B. returned to private life after the second restoration. He was the author of a history of the campaign of Naples, and of a *Mémoire sur la révolution de Naples* (1803).

BONANZA, *bō-năn'zâ* or *bŏn-ăn'za* [Sp. *bonanza*, prosperity] : rich mass of ore : suddenly discovered but continuous source of prosperity ; fortunate stroke. The word came into use in English from the mines and diggings of California. The silver mines on the Comstock lode in Nevada, the yield of which was very large for a few years, got from that circumstance the title of B. mines.

BONAPARTE, *bō'na-pârt*, It. *bo-nâ-pâr'tā*, FAMILY OF: Italian family; later French, and prominent in European history. In the 13th c., and afterward, several families named B. appear in Italian records—at Florence, San Miniato, Sarzano, and Genoa; and toward the close of the 15th c., a branch of the Genoese B. family settled at Ajaccio, in Corsica, where they occupied a respectable position as patricians, *padre del commune* or *cittadini*, in the middle of the 16th c. In the 18th c., this family was represented by three male descendants, all residing at Ajaccio: the archdeacon, Lucien B.; his brother, Napoleon B.; and their nephew, Charles.—For the emperor, see NAPOLEON I.

CHARLES BONAPARTE: 1746, Mar. 29—1785, Feb. 24; father of the Emperor Napoleon. He studied law at Pisa; married 1767—without the consent of his uncles—a beautiful young patrician, named Letizia Ramolino. In 1768, he removed with his family, accompanied by his uncle Napoleon, to Corte, in order to assist General Paoli in defending the island against the French invasion. As the French prevailed, and further resistance was useless, Charles B. attached himself to the French interest, and in 1771 was included by Louis XV. in the election of 400 Corsican families to form a nobility. In 1773, through the influence of Marbœuf, gov. of Corsica, Charles B. was appointed royal counselor and assessor of the town and province of Ajaccio. In 1777, he was a member of the deputation of Corsican nobles to the court of France. In this capacity he resided for some time in Paris, where he gained for his son Napoleon, through the interest of Count Marbœuf, a free admission into the military school at Brienne. In 1779, he returned to Corsica, and in 1785 went to Montpellier, for his health, where he died of cancer in the stomach. He was a man of prepossessing exterior and amiable character. By his marriage with Letizia, he left eight children: Joseph B., King of Spain; Napoleon (q.v.), Emperor of the French; Lucien B., Prince of Canino; Maria Anna (afterward named Elise), Princess of Lucca and Piombino, wife of Prince Bacciochi; Louis B., King of Holland; Carlotta (afterward named Marie Pauline), Princess Borghese; Annunciata (afterward Caroline Marie), wife of Murat, King of Naples; Jerome B., King of Westphalia. These members of the B. family, with the children of Beauharnais (q.v.), adopted by the emperor Napoleon when he married Josephine, are distinguished as the *Napoleonidæ* of modern French history. By a decree of the senate, 1804, Nov. 6, the right of succession to the throne was restricted to Napoleon and his brothers Joseph and Louis, with their offspring. Lucien and Jerome were excluded on account of their unequal marriages. Napoleon intended to give the right of succession also to Lucien, by the additional act of 1815, April 22; but this was never concluded. As Joseph, the eldest brother of the emperor, had no son, the descendants of Louis became nearest heirs to the throne.

MARIA LETIZIA RAMOLINO; 1750, Aug. 24—1836, Feb. 2; b. Ajaccio; mother of Napoleon I.: lived to see her

family placed on the thrones of Europe, and also witnessed their downfall. After the death of her husband, she lived for some time in Corsica, and in 1793, when the island came under British rule, removed with her family to Marseille, where she lived in poverty, mainly supported by the pension given to Corsican refugees. After her son became first consul, she removed to Paris, and when her son was crowned in 1804, received the title Madame Mère. A brilliant court-household was given to her, which, however, was never pleasing to her modest tastes. Remembering former adversities, and foreboding reverses of the splendid success of her sons, she was prepared for all that followed. After the downfall of Napoleon, Letizia lived with her step-brother, Cardinal Fesch, in winter at Rome, and in summer at Albano, and submitted to her change of fortune with remarkable dignity. At her death she left considerable property, the result of saving habits during prosperity.

BONAPARTE, JOSEPH: 1768, Jan. 7—1844, July 28; b. Corte, Corsica: eldest brother of Napoleon. He was educated at Autun. On the death of his father, he returned to Corsica, exerted himself to support the younger members of the family, and removed with them to Marseille, 1793. In 1797 he was elected a member of the Council of Five Hundred, and in the same year was sent as ambassador from the republic to Rome. In 1800, after he had proved his ability in several offices of state, he was chosen by the first consul as plenipotentiary to conclude a treaty of friendship with the United States. He signed the treaty of peace at Luneville, 1801, Feb. 9, and that of Amiens, 1802; and with Cretet and Bernier conducted the negotiations relative to the *concordat*. After the coronation of Napoleon, new honors fell to the share of Joseph B., who was made commander-in-chief of the army of Naples; in 1805, ruler of the Two Sicilies; and in 1806, king of Naples. Though, during his reign, some beneficial changes of government were effected—such as the abolition of feudality, the suppression of convents, the formation of roads, the repression of banditti, the organization of laws, etc.—yet these reforms were not managed judiciously; and the collision that frequently occurred between his own humane endeavors and the reckless promptings of his imperial brother, who looked upon Naples simply as a province of the French empire, exposed only too well to the Neapolitans the weakness and dependence of their new sovereign. But, in truth, he was far too fond of the fine arts to be a vigorous ruler in stormy times; and he is accused of leaving affairs too much in the hands of his minister, the subtle Salicetti. In 1808, Joseph B. was summarily transferred by his brother to the throne of Spain, and Murat took his place as king of Naples. For Joseph, this was no favorable change: he found himself unprepared to cope with the Spanish insurgents, and after the defeat of the French at Vittoria, he returned to his estate at Morfontaine, in France. In 1813, when Napoleon recognized Ferdinand VII. as king of Spain, Joseph B. re-

fused, at first, to abdicate, though he had many times before implored his brother to release him from his royal chains; but he soon submitted, as in all other matters, to the emperor's will.

After the battle of Waterloo, he accompanied Napoleon to Rochefort, whence they intended to sail separately for North America. In his last interview with Napoleon, Joseph generously offered to give up the vessel hired for his own escape, but meanwhile Napoleon had determined to surrender himself into the hands of the English. After a residence of some years at Point Breeze, New Jersey, where he employed himself in agriculture, and was highly esteemed by his neighbors, Joseph B. went to England, 1832, having previously, on hearing of the July revolution, written a letter to the house of deputies, in which he advocated the claims of his nephew, the late emperor of France, and in 1841 was allowed to return to his wife, who had remained in Italy since 1815. He died in Florence. Joseph was the only one of his brothers for whom Napoleon professed to care anything. He was a handsome, intelligent-looking man, distinguished by the elegance of his manners and conversation. His wife, JULIE MARIE CLARY (1777, Dec. 26—1845, Apr. 7), was the daughter of a wealthy citizen of Marseille, and sister-in-law of Bernadotte, King of Sweden. She was a quiet unambitious woman, with no taste for the splendors of royalty, which fell to her share during a few weeks only at Naples, for she never went to Spain. Ill health appears to have prevented her accompanying her husband to America. She died in Florence. By her marriage with Joseph B., she had two daughters—1. Zenaide Charlotte Julie (1801, July 8—1854), who became the wife of Lucien B.'s son, the Prince of Canino; 2. Charlotte Napoléone (1802, Oct. 31—1839, Mar. 3), who married Louis Napoleon, second son of Louis B., King of Holland; he died 1831, Mar. 17.

BONAPARTE, LUCIEN, Prince of Canino, brother of Napoleon: 1775-1840, June 30; b. Ajaccio; received his education in the college of Autun, the military school at Brienne, and the seminary at Aix. Rising gradually from one office to another, he was elected deputy for the department Liamone, and in the Council of Five Hundred spoke against the squandering of state-property, and formed a party favorable to the views of his brother Napoleon. Shortly before the 18th Brumaire, he was elected president of the Council of Five Hundred, and was the hero of that day. During the ferment which followed Napoleon's entrance, Lucien left his seat, mounted his horse, and riding through the ranks of the assembled troops, called upon them to rescue their general from assassins. Afterward appointed minister of the interior, he was active in the encouragement of education, art, and science, and organized the prefectures. As ambassador to Madrid, 1800, he contrived to gain the confidence of King Charles IV. and his favorite Godoy, thus putting aside the British influence which had until then been exercised at the court of Spain. It is said that for his services in the treaty of peace con

cluded between Spain and Portugal, 1801, Sep. 29, he received 5,000,000 francs.

His constant opposition to Napoleon's progress toward monarchy involved Lucien in several misunderstandings with his brother; and their quarrel was brought to an issue by Lucien's second marriage against the views of Napoleon On condition that he would divorce his wife, the crowns of Italy and Spain were offered to Lucien; but he refused them, and preferred living in retirement at his estate of Canino, in the province of Viterbo, near the frontiers of Tuscany, where he gave his time to art and science. Here he had the friendship of the pope, who created him Prince of Canino and Musignano; but having denounced in his private capacity the arrogant and cruel policy of his brother toward the court of Rome, he was 'advised' to leave the city, in which he was at that period residing. In 1810, he took ship for America, but fell into the hands of the English; was taken to England; and after a debate in parliament, was declared to be a prisoner, but treated with distinction. After his brother's downfall, he returned to Rome.

After the defeat at Waterloo, Lucien B. alone seems to have preserved his presence of mind. He immediately advised his brother to dissolve the chambers, and assume the place of absolute dictator. After the second ascent of the throne by Louis XVIII., Lucien lived for some time in and near Rome. In 1830, he went to England, visited Germany 1838, and died at Viterbo. Lucien B. possessed considerable talents and firmness of character. He was in his early years a keen republican, but the weakness of the Directory convinced him that a military consulship was necessary to allay the social anarchy of France. He consequently threw himself eagerly into the designs of his brother, but protested against Napoleon giving way to his desire for a hereditary monarchy. As a writer he was by no means successful. His long and tedious epic poem, *Charlemagne ou l'Eglise Délivrée*, in 24 cantos, was written and published in London, and was dedicated to the pope, 1814. Another heroic poem, *La Cyrnéide ou la Corse Sauvée*, followed in 1819. The *Mémoires Secrets sur la Vie Privée Politique et Littéraire de Lucien B.* (2 vols. Lond. 1819), of which Alphonse de Beauchamp is supposed to be the author, is an untrustworthy book. See Jung, *Lucien B. et ses Mémoires* (3 vols., Par. 1882–83). In 1795, Lucien married Christine Boyer, daughter of a citizen of St. Maximin. After her death, he married, 1803, the widow of a stockbroker, Madame Jouberthon, who survived him. By his first marriage, he had two daughters, Charlotte (1796–1865), who married Prince Gabrielli of Rome; and Christine (1798–1847), who married first a Swedish count named Posse, and then Lord Dudley-Stuart. By his second marriage, Lucien had nine children: the eldest daughter, Letizia B. (1804–71) married, 1824, Mr. (afterward Sir) T. Wyse, an Irish gentleman; but a separation took place in a few years.—The second daughter, Jeanne B., distinguished by her beauty and taste for poetry, b. 1806, died

soon after her marriage with the Marchese Honorati.—The third daughter, ALEXANDRINE MARIE B. (b. 1818), married, 1836, Count Vincenzo Valentini de Canino, and gave birth to two sons and one daughter.—CONSTANZE, youngest daughter of Lucien B., was born 1823.—CHARLES LUCIEN JULES LAURENT B., eldest son of Lucien B., Prince of Canino and Musignano (1803–1857, July 29; b. Paris), never showed any inclination for political life, preferring the more quiet and wholesome pursuits of literature and science. He acquired considerable reputation as a naturalist, and especially as a writer on ornithology, and was a member of the principal academies of Europe and America. His chief publications are a continuation of Wilson's *Ornithology of America*, and the *Iconografia della Fauna Italica*.—The second son, PAUL MARIE B. (1808–27), took part in the Greek war of liberation, and died by the accidental discharge of a pistol.—The third son, LOUIS LUCIEN B. (b. 1813, Jan. 4), has distinguished himself by his studies in chemistry, mineralogy, and languages, and has lived much in England.—PIERRE NAPOLEON B., the fourth son (1815, Sep. 12—1881, Apr. 8), passed through many changes of fortune in America, Italy, and Belgium, and returned to France 1848. In 1871, he shot a journalist, Victor Noir; and being tried, was acquitted of the charge of murder, but condemned to pay $5,000 to Victor Noir's relatives.—The youngest son, ANTOINE B. (1816–83), fled to America after an affair with the papal troops in 1836; returned to France, 1848; in 1849 was elected into the national assembly; retired from politics, 1851.

BONAPARTE, LOUIS, third brother of Napoleon: 1778, Sep. 2—1846, July 15; was educated in the artillery school at Chalons, where he imbibed anti republican principles. After rising from one honor to another, he was made king of Holland, 1806; but, in fact, he was never more than a French governor of Holland, subordinate to the will of his brother. Amid all the faults which marked his reign, it must be remembered to his credit that on several occasions he firmly withstood the demands of France; that he replied to one requisition by saying that, since he had been placed on the throne of Holland, he had 'become a Dutchman;' that he nobly refused to accept the tendered crown of Spain; and lastly, that he did not enrich himself during his reign. After the restoration of the House of Orange, Louis considered himself free from all responsibility, and returned to Paris, 1814, Jan. 1., where he was coldly received by the emperor. After living some years in Rome —where he separated from his wife—he removed, 1826, to Florence, where he lived in retirement. On the escape of his son, Louis Napoleon, from the prison of Ham, the ex-king of Holland was removed as an invalid to Livorno, where he died. Louis B. was the writer of several works: *Marie, ou les Hollandaises*, 1814, a novel, giving some sketches of Dutch manners; *Documents Historiques, etc., sur le Gouvernement de la Hollande* (3 vols., Lond. 1821); *Histoire du Parlement Anglais*, 1820; and a critique on M. de Norvin's *History of Napoleon*. Louis B. was married, 1802,

to Hortense Beauharnais, daughter of General Beauharnais (q.v.) by his wife Josephine, afterward Empress of the French. As this marriage was wholly a matter of submission to his brother's will, and put aside a former engagement, it naturally ended in unhappiness and separation.

HORTENSE EUGENIE BEAUHARNAIS, adopted daughter of Napoleon, Queen of Holland, and Countess St. Leu: 1783, Apr. 10—1837, Oct. 3; b. Paris. She was amiable and accomplished. After the execution of her father, she lived for some time in humble circumstances, until Napoleon's marriage with Josephine. In obedience to the plans of her step-father, she rejected her intended husband, Gen. Desaix, and married Louis B. 1802. In 1814, she was the only one of all the *Napoleonidæ* who remained in Paris. After the Hundred Days, she visited Augsburg and Italy, and then fixed her residence at Arenenberg, a mansion in the canton Thurgau, where she lived in retirement, sometimes spending a winter in Italy. In 1831, when her two sons had implicated themselves in the Italian insurrection the countess travelled in search of them through many dangers, and found the elder deceased, and the younger, the late Emperor of the French, ill at a place near Ancona. Returning with her son to Paris, she was pleasantly received by Louis Philippe and by Casimir Périer, but was compelled in a few weeks to remove with her son to England. After some stay there, she removed to her country-seat, Arenenberg, where she died, after severe suffering, and was buried near the remains of her mother, Josephine, at Ruel, near Paris. She was the authoress of *La Reine Hortense en Italie, en France, et en Angleterre, pendant l'année* 1831, and wrote several excellent songs. She likewise composed some deservedly popular airs; among others the well-known *Partant pour la Syrie,* which the late Emperor of the French, with a delicate union of political tact and filial pride, made the national air of France. Of her three sons, the eldest, NAPOLEON LOUIS CHARLES (1803–07, Mar. 6), died in childhood. The second, LOUIS NAPOLEON, Crown-Prince of Holland (1804–31, Mar. 17), married his cousin Charlotte, daughter of Joseph B., and died at Forli. The third, CHARLES LOUIS NAPOLEON, became Emperor of the French: see LOUIS NAPOLEON.

BONAPARTE, JEROME, youngest brother of Napoleon: 1784, Nov. 15—1860: after receiving his education in the college at Juilly, served as naval lieut. in the expedition to Hayti. When war broke out between France and England, 1803, Jerome was cruising off the West Indies, but he was soon compelled to take refuge in the port of New York. While in America, he married Elizabeth Patterson, (q.v.),dau. of a merchant in Baltimore, 1803, Dec. 27. Subsequently, he was employed by Napoleon in the liberation of Genoese prisoners who had been captured by the dey of Algiers. In the war with Prussia, he commanded, in concert with General Vandamme, the tenth corps in Silesia, and, 1807, Dec. 1, was made king of Westphalia. He was recognized with great pomp at Cassel, where he lived in splendor, caring very little for government, not even tak-

ing pains to acquire the vernacular language of the country. After the war with Austria, the finances of Westphalia, through mismanagement, plunder, and extravagance, as well as war-expenditure, were found in an exhausted condition. The battle of Leipsic brought the reign of Jerome to a close. After the peace of 1814, he left France, and resided in Switzerland, at Grätz, and in the beginning of 1815, at Trieste. He was made a peer when Napoleon returned from Elba, and fought by the side of the emperor at Ligny and at Waterloo. After his brother's abdication, he left Paris, June 27, and visited Switzerland and Austria, but ultimately settled in Florence. His request to be allowed to return to France was rejected 1847, by the chamber of peers, but was afterward granted, and at the outbreak of the February revolution Jerome B. was in Paris, where he was appointed governor of the Invalides 1848, and in 1850 was made a French marshal.

His marriage with Elizabeth Patterson having been declared null by Napoleon, Jerome was forced, after he had gained the Westphalian crown, to marry Sophia Dorothea, daughter of King Frederick I. of Würtemberg. After the battle of Waterloo, her father wished to annul the marriage, but the wife of Jerome declared her resolution to share through life the fortunes of her husband. Jerome B. had one son by his first marriage (see below), and had three children by his second wife.—JEROME B., elder son (1814, Aug. 24—1847, May 12).—MATHILDE LETITIA WILHELMINE B., Princess of Montfort (b. Trieste, 1820, May 27), married the Russian Count Anatol Demidov, and lived with her husband at the court of Louis Napoleon during his presidency.—The younger son, NAPOLEON JOSEPH CHARLES PAUL B. (see NAPOLEON, JOSEPH, etc.) (1822–91), married 1859 Princess Clotilde, by whom he had two sons and a daughter, and his eldest son became 1879 the heir of the Bonapartist hopes.

JEROME NAPOLEON B., (1805–70, b. Camberwell, England), son of Jerome B. by Elizabeth Patterson, graduated at Harvard 1826, then studied law, but never engaged in legal practice; nor was he ever naturalized as a citizen of the United States, though he resided all his life in Baltimore, Md., maintaining intimate relations with the Bonaparte family. By his management of his inherited fortune and of the estate that came to him by marriage, he became one of the richest men in Baltimore. He left two sons, who inherited his wealth as well as that of their grandmother at her death 1879.—JEROME NAPOLEON B. (1830–93, b Baltimore), son of Jerome Napoleon B., graduated at West Point 1852, and receiving the commission of 2d lieut., served on the Tex. frontier. He resigned 1854 and was commissioned lieut. of dragoons in the French army. In the Crimean war he gained distinction at Balaklava, Inkerman, and Tchernaia, and received many decorations. His next service was in Algeria. In the Italian war between France and Austria he distinguished himself in the battles of Montebello and Solferino and in several skirmishes. He became *chef d'escadron* 1865, and was transferred to Em-

press Eugenie's dragoon guards. He returned to the United States 1871. He d. at Beverly, Mass.—His bro., CHARLES JOSEPH B. (b. Baltimore, 1851, June 9), son of Jerome Napoleon B. (first), graduated at Harvard 1871 and at the Harvard Law School 1874, and adopted the law as a profession, in Baltimore. He first came into political prominence in 1875, through his opposition to the corrupt methods of the party then in power, and he was selected as special counsel to prosecute the ballot-box frauds. In 1895 he was appointed supervisor of elections, and in 1902 he was appointed a member of the board of Indian Commissioners. He subsequently became a member of the executive committee of the National Civic Federation, and in 1904 he received the appointment of special counsel for the Government to prosecute post office frauds. In May, 1905, he was appointed by President Roosevelt Secretary of the Navy, to succeed Paul Morton, resigned. and in 1906, Dec. 17, became attorney-general.

For Emperor B., see NAPOLEON I.

BONAPARTEAN, a. *bō-na-pârt'e-an:* pertaining to any of the Bonapartes. BO'NAPARTISM, n. *-ĭzm,* the views or procedure of the house of Bonaparte. BO'NAPARIST, n. *ĭst,* supporter of the Bonaparte family, especially of Napoleon I. or III.; or a partisan of their dynasty.

BONA-PERITURA, n. *-pĕr-ĭ-tô'ra,* [L.]: in *law,* perishable goods.

BONAR, *bō'-nâr,* HORATIUS, D.D.: clergyman of the Free Chh. of Scotland, prolific author, and hymnologist: 1808, Dec. 19 —1889, July 31; b. Edinburgh. After graduating at Edinburgh Univ., he was minister at Kelso 1838–66, leaving, with his congregation, the Established Chh. of Scotland 1843; and pastor of the Grange Free Chh., Edinburgh, from 1866 till his death. Biblical prophecy has engaged his study. He has published many sermons, tracts, etc. His daughter married the Rev. G. Theophilus Dodds, and with him labored earnestly in the McAll mission, Paris (see Dr. B.'s *White Fields of France*). Of his hymns—many of which breathe a tender and beautiful devotion—the three most noteworthy collections are *Hymns of Faith and Hope* (3 vols. 1857–71): *The Song of the New Creation, etc.* (1872); *Hymns of the Nativity* (1878).

BONASIA, *bō'-nā-sĭâ:* genus of gallinaceous birds of the Grouse (q.v.) family or *Tetraonidæ,* perhaps more properly only a sub-genus of Grouse (*Tetrao*), distinguished by having the toes and the lower part of the tarsus (or shank) destitute of feathers; also by the elongated feathers of the upper part of the head. To this genus belongs the Hazel Grouse of the continent of Europe (*Tetrao Bonasia* of Linnæus), a species which, though not found in Britain, is very widely distributed from Siberia to Africa, and throughout that continent. In size, it scarcely exceeds the common partridge, is prettily mottled with gray and reddish brown, and has a black band near the extremity of the lateral tail-feathers. It prefers the deepest solitudes of

forests. The eggs are 12–18 in number. The flesh of this bird is highly prized, and German etiquette has long assigned it a place above all other dishes at the tables of princes, as the only dish which may be served twice in succession. Another species of B. is the Ruffed Grouse of America (*B. Umbellus*, or *Tetrao Umbellus*), known also in some parts of the United States by the names of Pheasant and Partridge. It is nearly equal in size to the black-cock of Europe. Besides having the feathers of the upper part of the head elongated, the male has a large shoulder-tuft on each side. This bird is found in almost all parts of N. America, from the Gulf of Mexico to Hudson's Bay, and from the Atlantic to the Pacific. It is polygamous, and in spring the males make a noise called *drumming*, by rapid clapping of their wings, to attract the attention of the other sex, while they also strut with erected ruff and tail, and with wings depressed, after the manner of the turkey-cock. At this time they have fierce battles with one another, and advantage is sometimes taken of their jealous pugnacity to attract them within shot, by an imitation of their drumming, accomplished by means of a bladder and a stick. The nest is formed on the ground in the woods, often under a bush, and 5–12 eggs are laid in it. The flesh of the Ruffed Grouse is much esteemed, and the markets of cities and towns are well supplied with it in winter.

BONASUS, n. *bō-nā'sŭs* [L. *bonāsus*]: an animal of the ox kind, having a mane like a horse, found in Lithuania, in Europe; the *bison* or *aurochs*. See BISON.

BONAVENTURA, *bo-nâ-vĕn-tô'râ*, SAINT (real name John of Fidanza): 1221–74, July 15; b. Bagnorea, Tuscany: one of the most eminent Rom. Cath. theologians. In 1248, he became a Franciscan monk; in 1253, a theological teacher at Paris, where he had studied; and in 1256, general of his order, which he governed strictly but affectionately. The influence of his character now began to penetrate the church; and it was mainly through his eloquent persuasion that the differences which had sprung up among the cardinals on the death of Clement IV., 1268, were reconciled, and all induced to unite in electing to the papal dignity Tedaldus Visconti (Gregory X.). The new pope created B. Bishop of Albano, and cardinal, 1273, when he accompanied Gregory to the Council of Lyon, where he died from sheer ascetic exhaustion. He was honored with a splendid funeral, which was attended by the pope, the king, and all the cardinals.

On account of his unspotted character from earliest youth, as well as the miracles ascribed to him, he received, even during his life, especial veneration. Dante, who wrote shortly afterward, places him among the saints of his Paradiso in 1482, he was formally canonized by Sixtus IV.; and in 1587, was ranked by Sixtus V. as the sixth of the great doctors of the church. The religious fervor of his style procured for him the title of *Doctor*

Seraphicus, and his own order are as proud of him as the Dominicans are of Thomas Aquinas. A great part of his writings is devoted to the praise of his order, and to the defense of Mariolatry, celibacy, transubstantiation, communion in one kind, and other doctrines and practices of the middle ages, which he attempts to deal with in a philosophical manner. His most important works, the *Breviloquium* and *Centiloquium*, are properly text-books on dogmatics. Unfortunately, his efforts to philosophize the church creed, and that deep mysticism in which his spirit reveled, make him often obscure and unintelligible even in his most popular treatises. With B., theology is the goal of all art and science; and in his *Itinerarium Mentis in Deum*, as also in his *Reductio Artium in Theologiam*, he represents union with God, to which the soul attains through six stages, as the highest good. He did more than any other of the early theologians to give scientific form to the mystical theology. His *Biblia Pauperum*, or 'Poor Man's Bible.' is a mystico-allegoric explanation of the plain contents of the sacred books for the benefit of the laity. In warmth of religious feeling, however, and in the practical tendency of his ethics, he far excels the hair-splitting scholastics. In his commentary on the *Sententiæ* of Peter the Lombard, he acutely argued against the eternity of the world, and also advanced some original proofs of the immortality of the soul. The most complete edition of his works appeared at Rome (8 vols. 1588–96).

BONAVISTA, *bŏn-a-vĭs'ta:* bay and cape on the e. coast of Newfoundland, lat. 48° 42′ n., long. 53° 8′ w.

BONBON, n. *bŏng'bŏng'* [F.]: a sweetmeat; a sugarplum.

BONCHAMP, *bŏng-shâng'*, CHARLES MELCHIOR ARTHUR, Marquis DE: 1760, May 10—1793, Oct. 17; b. Jouverdeil, in the old province of Anjou: a leader of the Vendean party in the civil war consequent upon the French revolution. He took part, like many young French officers, in the American war of liberation; and when he returned to France, was made captain. Of strong royalist principles, he looked with disfavor on the revolution. After living some eighteen months in solitude, he allowed himself to be chosen leader of the Anjou insurgents. The army of La Vendée would have been more formidable if B.'s tactics had been adopted, but this was not done until it was too late. In the sanguinary encounter at Chollet, 1793, Oct. 17, B. received a fatal shot in the breast, and when his followers vowed to revenge his death on 5,000 republican prisoners, the dying hero exclaimed: 'Spare your prisoners. I command it.' This last command was obeyed.

BOND, n. *bŏnd* [AS. *bindan*, to bind; *bonda*, a boor, a householder: Icel. *bondi*, a husbandman: Ger. *band*, a string: old Dut. *bond*, a tie]. anything that binds, as a rope, a chain, etc.; union; an obligation; a vow or promise; a written agreement; in *masonry*, the connection established among the stones or bricks in a wall, by a certain

disposal of some of them: see BRICK-LAYING: V. to place in government storehouses; to secure; to give bond for. BOND'ING, imp.: ADJ. putting in a government warehouse, as duty unpaid goods. BOND'ED, pp.: ADJ. applied to goods left in bond-stores. BONDS, n. plu. *bŏndz*, chains; imprisonment; in *carp.*, all the timbers disposed in the wall of a house; also called *bond-timber*. BOND-STORES, or BONDED STORES, *-stōrz*, government warehouses where goods are stored until such time as the duty has been paid. BOND, a. in a state of servitude or slavery; bound —as BONDMAN, BONDMAID, BOND-SERVANT, BOND-SERVICE, BOND-SLAVE. BONDAGE, n. *bŏn'dāj* [OF. *bondage*—from mid. L. *bondāgĭŭm*, a low kind of tenure]: slavery; servitude of a grinding description; imprisonment. BONDSMAN, n. *bŏndz'măn*, a slave; a surety. IN BOND, in government warehouse till the duty be paid. BONDFOLK, n. men, women, and children collectively in bondage or slavery.—SYN. of 'bonds' and 'bondage': chains; fetters; captivity; imprisonment; incarceration; confinement; slavery; servitude; immuring; thraldom.

BOND: primarily an instrument in writing signed and *under seal*, carrying an obligation. In the narrower, commercial sense, a duly authenticated obligation to repay money loaned, accompanied by some guaranty or security. The form most in use is that in which the security is a pledge or mortgage of property. But bonds of governments, states, and municipalities are ordinarily issued upon the pledge of the public faith and credit, in some instances specific revenues being set aside to cover them. Formerly this class of obligations were called *stocks*, but this form is now used to designate other securities. The common real estate *bond and mortgage* served as a basis for the other classes; it is now almost invariably executed on printed forms containing the uniform requisites, and filled in in writing; the bond has come to be regarded the subordinate instrument; the mortgage the essential one. This is quite otherwise in the case of such obligations when issued by corporations, where it is desired to have numerous persons participate in the lending of money; the mortgage is made to a trustee for all parties, usually a trust company; the bond is divided into parts, each for a round amount; printed, lithographed or engraved forms duly executed, are used; and these are made readily negotiable separate from the mortgage, largely by custom, but nevertheless under supervision of the law.

A survival of the old form is the present *registered bond*, in which the name of the obligee is inscribed; as this necessitates a written assignment and hence tends to delay negotiation, the great mass of bonds are payable to *bearer*. Interest on registered bonds is usually paid by check; some however, are issued like the bearer bonds, which have *coupons* (small certificates for fixed sums) attached, to evidence the periodic obligation for interest, which are cut off (fr. *coupée*) and collected as checks are.

In order to conform the requirements a bond must bear

a date, express the obligation to pay a fixed sum, clearly state when, where and how both principal and interest are payable, state the security pledged, in general terms, as well as any conditions affecting these several particulars. In addition to the execution by the proper officers it must be authenticated by the trustee of the pledged property who certifies that the bond is secured thereby.

In the United States the usual denomination of bonds is $1,000; the federal government issues registered bonds in sums as high as $50,000; and in both forms divides also into $500, $100 and $50 denominations. To encourage small investors $20 bonds were used in one issue. States and municipalities usually follow the government in this respect; but few corporations deviate from the $1,000 form.

Corporate bonds are substantially described when those of railway companies are discussed. The latter are by far the most important class in our financial world, the aggregate issues exceeding $8,000,000,000 in par value, varying in form according to the security or condition of payment.

The *first mortgage bond* stands highest in character because secured by a first lien upon all of the property upon which it is issued; generally speaking default in payment of interest thereon brings about a foreclosure sale of the property, imperiling the interests of the owners (the stockholders). In cases where a corporation has absorbed others the bonds of the latter often remain as *prior liens* upon their specific property; and with respect to the latter the first mortgage issue of the acquiring company are subrogated for the time being.

It frequently occurs that *second mortgages* are used; also third, fourth and even fifth mortgages are known; these are of course all subordinated in rights, in their order, to the firsts, both as to principal and interest. In the course of extension of railways and the maturing of some issues of bonds, *general, consolidated,* or *refunding* mortgages are made use of; these secure the holders of bonds issued thereunder, with rights subordinate to first or other prior liens; but in most instances they become paramount liens when the preceding ones are paid off; and these issues should provide ample means for such payments. Many of these issues have in the course of time become first liens. A further class, not so desirable, are the *income* bonds; more or less adequately secured as to principal, but receiving interest only when a surplus of earnings remains after providing for other outlays. In some instances bonds are issued to construct new lines, secured by pledge of the specific property created, known as *divisional mortgages;* in like manner *terminal, bridge,* and *equipment* bonds, also *car trusts,* are issued based upon the properties acquired therewith. It is not always the case that these obligations are protected by any other lien, even subordinate, upon the general corporate property.

Collateral trust bonds are issued upon a pledge of securi-

ties owned by the corporation or purchased with such bonds. They depend primarily, and often exclusively, upon the value of the securities and their earning capacity, for the guaranty that principal and interest will be paid, having no lien upon the property of the issuing corporation unless so specified. Should the pledged securities consist of mortgage bonds, the holders of the collateral trusts may in case of default secure these and the property behind them and thus protect themselves. A rather questionable practice has obtained in a few cases of permitting the issuing corporation to exchange the collateral deposited with the trustee, substituting others, which may or may not be better.

Debentures, a form of so-called bond, are not strictly so classifiable in practice here; a few railway companies report such issues as *bonds, no mortgage;* indicating the fact that the obligations are unsecured and vary from the corporate promissory notes only in that they are sealed instruments; in practical effect they have no higher standing.

Convertible bonds, as the name implies, are such as have the privilege of conversion into shares of stock at the option of the holder, in addition to whatever other conditions of issues may exist.

Certain issues are designated *sinking fund bonds* by reason of a provision for their retirement prior to maturity in whole or in part, by the periodical (annual) application of surplus income to that end. Ordinarily a price above parity (105 or 110) is fixed in the bond at which such retirement may be effected. The right to redeem prior to maturity is quite frequently reserved in bond issues without a sinking fund provision. As all such provisions tend to shorten the period of investment the market value of the bonds is somewhat affected thereby.

The bonds issued by industrial corporations are in general of the same character as those described.

BOND, William Bennett, Canadian archbishop: b. Truro, N. S., 1815, Sept. He was educated at Bishop's College, Lennoxville; was ordained 1840; became a priest 1841; was rector of St. George's church, Montreal, 1860–72; dean 1872–8; became bishop 1876; since 1901 has been archibishop of Montreal; and since 1904 primate of all Canada.

BOND, William Cranch: 1789–1859; b. Portland, Me.: astronomer. He was a watchmaker, when an eclipse, in 1806, led him to a study of astronomy. He continued at his trade; but gave much of his time to study, and secured a private observatory at Dorchester (now a part of Boston), where his discoveries attracted attention. He was one of the first American observers to note the comet of 1811. In 1815 he was sent to Europe, with a commission in reference to a proposed observatory for Harvard University. In 1838, he was appointed by the U. S. govt. to accompany Wilke's exploring expedition to the South Sea, and make astronomical and meteorological observations. The next

year he superintended the building of the Harvard observatory, and became its director (1840). He was one of the first to apply photography to celestial phenomena.—His son, GEORGE PHILLIPS B. (1825–1865, Feb.; b. Dorchester) graduated at Harvard 1845, and succeeded his father as prof. of astronomy and director of the observatory 1859. His treatise on the Rings of Saturn and other works gave him wide repute.

BOND CREDITOR: term sometimes applied to a creditor whose debt is secured by a bond, and therefore privileged as a specialty: see BOND, in Law.

BONDED WAREHOUSE: see WAREHOUSING SYSTEM.

BÖNDER: in Norway and Sweden, a class of landowners or farmers corresponding in some respects to the barons and burgesses in England. Under the ancient rulers they were very powerful, and often forced important concessions from their kings.

BONDI, *bŏn'dē*, CLEMENTE: 1742–1821; b. Mizzano, Parma: Italian poet. He was educated by the Jesuits; and when still very young, appointed to deliver lectures in rhetoric, in the Royal Convent at Parma. Here he produced his first work, *Giornata Villereccia* (Parma, 1773). After fleeing from a priestly persecution, he found a patron in the Austrian Archduke Ferdinand, and fixed his residence in Vienna, where he died. His poems are lyrical, descriptive, satirical, and elegiac. They please persons of culture and delicate sensibilities by the light-flowing elegance of their versification, and the rare purity of their style. Among his larger works are *La Conversazione*, *La Felicità*, and *Il Governo Pacifico*. Italians consider B.'s translation of the *Æneid* to possess remarkable excellence. His entire works were published at Vienna, 1808.

BONDOU, or BONDU, *bŏn-dô':* a former kingdom in Senegal, West Africa, now a French protectorate. The soil is fertile, producing cotton, indigo, millet, maize, tobacco, etc. The weaving of cotton cloth, which, besides being made up into articles of dress, is used as currency, forms part of the industry of the people. The surface of B. is level, with elevations in the north and central parts; the climate generally healthful, and vegetation luxuriant alike in field and forest. Iron is said to be plentiful, though not much worked, and the gold is obtained in small quantity. Wild animals are numerous; and the principal river on the e. border of the country, the Falemé, abounds with crocodiles. The inhabitants of B. profess Mohammedanism, trust greatly in sorcerers, and are chiefly of the Fulah tribe. B. exports some cattle, corn, and gums but its trade is unimportant. Pop. estimated 1,500,000.

The capital, Bulibani, is in a plain bounded by rocky hills and forests, on the left bank of the Falemé. Its streets are unpaved and dirty, and its buildings mean and miserable; mud-walls surround it, and in its centre is the extensive but rude palace of the sovereign. Pop.

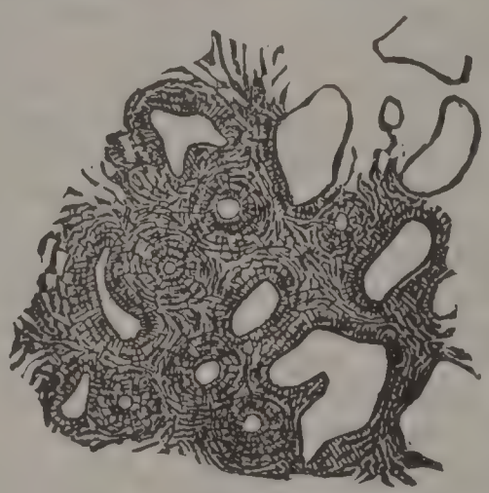
about 2,200; composed in great part of slaves, from the sale of which the ruler formerly derived considerable revenue.

BONDY, *bōng-dē′:* town of France, dept. of the Seine, 7 m. e.n.e. of Paris, on the Ourcq canal. It has many country residences, but is noted particularly for its great forest, which covers about 5,000 acres, and was, so it is claimed, the scene of the assassination of Childeric II., King of Austrasia, by Bodillon, 673; and also of the murder of Aubry de Montdidier. These crimes, and several others, had given B. a sad celebrity, which it has happily lost; and it is now for the Parisians one of the most charming retreats. During the siege of Paris, 1870–71, B. was the scene of several terrible conflicts between the French and the Germans. Pop. 3,004.

BONE, n. *bōn* [AS. *ban; Ger. bein;* Icel. *bein,* the bone of the leg: Dut. *been;* W. *bon,* a stem or base, the legs being the stems or supports of the body]: one of the stems or supports of the body: the firm hard substance that composes the framework or skeleton of vertebrate animals; any part of the skeleton: ADJ. made of bone: V. to take out bones; to stiffen with whalebone. BONES, n. plu. *bōnz,* bobbins of bone for lace-making. BON′ING, imp., sometimes spelled BONEING: N. taking bones out of meat. BONED, *bōnd,* pp.: ADJ. having large bones; strong. BONE′-LESS, a. *-lĕs,* without bones. BONY, a. *bō′nĭ,* full of bones; stout; strong; consisting of bone; hard and brittle. BONE-ASH, the impure phosphate of lime obtained by burning bones. BONE-BLACK, charred bones. BONE-BROWN or IVORY-BROWN, bone and ivory roasted till they become of a brown color throughout. BONE-DUST, ground bones. BONE-EARTH, the earthy or mineral part of bones, consisting chiefly of phosphate of lime. BONE-ACHE, pain in the bones. BONE-BED, thin strata or layers found in several places in the earth's crust, so called from their containing innumerable fragments of fossil bones, scales, teeth, coprolites, etc. BONE-BRECCIA, an admixture of fragments of limestone and bones cemented together into a hard rock by a reddish calcareous concretion. BONE-LACE, flaxen lace. BONE-SPAVIN, a hard swelling on the inside of the hough of a horse's leg. BODY AND BONES, altogether; wholly. BONE-SETTER, one who is skilled in the setting of broken bones; an unqualified surgeon. BONE-SETTING, the restoration of a broken bone to its proper place. TO MAKE NO BONES OF, to have no scruples about the thing; to swallow it easily. BONE OF CONTENTION, a subject provocative of wranglings and ill-will—alluding to two dogs fighting for a bone. BONE TO PICK, a thing to divert or occupy attention; a cause of friendly fault-finding or censure; an unpleasant matter to settle.

BONE: the hard material of the skeletons or frameworks of mammalian animals, reptiles, and birds. It is developed from temporary cartilage (q.v.) which consists of cells massed together, except in the flat bones, as those

of the skull and shoulder-blade, of which the primary foundation is to a great extent of fibrous tissue. In this temporary cartilage points or centres of ossification develop, the cells alter their form and arrangement, and a deposit of earthy materials, phosphate and carbonate of lime, takes place, rendering the former flexible substance rigid. By soaking a B. in a dilute mineral acid, we can dissolve out these earthy matters, and render it again flexible; on the other hand, if we expose it to intense heat, the animal matter (gelatin) is got rid of, and though the bone retains at first its form, the slightest touch will cause its now unsupported earthy matter to crumble away. In the ill-nourished children of large towns are seen examples of the necessity of a proper relation of these two elements of B. to each other; in the disease called rickets, the earthy matter is deficient, and the too flexible leg-bones bend under the weight of the trunk. In the aged person the B. substance becomes more densely packed with earthy matter,



Transverse Section of Bone,
Showing its microscopic structure.

and becomes brittle, rendering them peculiarly liable to fractures.

The bones of the skeleton are classified according to their shapes—viz., as long bones, *e.g.* the thigh-bone and arm-bone; flat bones, as the shoulder-blade and skull-bones; short and irregular bones, as those of the wrist or the vertebræ. The substance of bones is arranged differently in different parts—either hard and close, which is called the condensed substance, or loose and reticulated, called the cancellated structure. *Long Bones* have a shaft of hard substance terminating at each end in soft or cancellated structure; in the latter situations, the B. is more expanded, and rounded off to enter into the formation of a joint. *Irregular Bones* consist of a shell of condensed tissue, inclosing a mass of cancellated structure, and are smoothed off into surfaces adapted to those of the adjoining bones. *Flat Bones* consist of two layers of hard tissue, with an intermediate cancellated structure, the diploë. Anatomists also talk of *mixed* bones, those which are both

long and flat, as the ribs, the breast-bone, and the lower jaw.

The shaft of a long B. is hollow, and filled with an oily substance, the marrow (q.v.); the space in which the marrow lies is called the medullary canal. This fatty substance is found also in the cancellated structure of short and mixed, and in the diploë of flat bones, and even in the condensed tissue. Bones are covered externally by periosteum (q.v.), and on the surfaces of the cavities within by a fine membrane called internal periosteum or medullary membrane. B. is largely supplied with blood-vessels, which are continued into it from those of the periosteum; the largest are those which enter the cancellated ends of the long bones. The medullary membrane receives a special artery for the supply of the compact tissue next the canal. This vessel enters the bone generally rather above its middle, and divides into two branches, one of which runs up, the other downwards, both dividing into numerous branches, anastomosing with the vessels we have alluded to as entering the cancellated tissue. After the arteries enter the compact tissue of bones, they run in small capillary canals, invisible to the naked eye, which permeate the bone, and anastomose, leaving oblong loops or meshes. The veins of B. also are contained in these canals, but they are larger than the arteries, and have at irregular intervals, where branches meet, dilatations or reservoirs for the blood. In addition to the blood-vessels, the canals contain nerves and lymphatics.

These canals, named Haversian, after their discoverer, Clopton Havers, an old English anatomist, vary in diameter from $\frac{1}{2500}$ to $\frac{1}{200}$ of an inch. They take a longitudinal direction, and if a transverse section is examined under the microscope, it appears pierced with holes, which are the Haversian canals cut across. Each canal is surrounded by its own layers of condensed structure, forming in the aggregate a hollow rod or pin, called the Haversian system, running through the B. In addition to these, there are to be seen a number of minute spaces or *lacunæ*, generally oval in man; from these pass numerous pores or *canaliculi*, which are directed to the nearest vessels; those in the periosteal, or outer, lamella pass into the B. from orifices on its surface, and the lacunæ face outward. The pores of the internal layer open on the medullary canal, and its lacunæ face toward it, and the lacunæ in the layers around each Haversian canal face toward, and their pores open into it.

The long bones have different centres of ossification, the shaft or diaphysis, and the ends or epiphyses. Each epiphysis is separated, in early life, from the shaft by a layer of cartilage and it is by means of this cartilage that increase in length is effected. A process of ossification of the cartilage goes on continually at each end when it adjoins the bone, but in proportion as it is ossified new cartilage is formed. At about the age of 20 years this

production of new cartilage ceases, ossification proceeds until the epiphyses and shaft form solid bone and then increase in length is not longer possible and the person is said to have 'got his growth.'

For the several bones composing the animal frame, see SKELETON; for important peculiarities in the bones of different classes of animals, see those classes.

Chemical Composition of Bone.—The principal chemical ingredients present in B. are collagen (which, on boiling, takes up water to form gelatin) and phosphate of lime; and the following table represents approximately the composition in 100 parts of B. of average quality.

	Human Bones	Ox Bones
Gelatin	33.30	33.30
Calcium Phosphate	53.04	57.35
Calcium Carbonate	11.30	3.85
Calcium Fluoride	0.20	0.15
Magnesium Phosphate	1.16	2.05
Sodium Salts	1.00	3.30
	100.00	100.00

When a B. is digested in dilute hydrochloric acid at a summer heat, the earthy matters are gradually dissolved out, leaving the gelatin of the size and shape of the original B., but now soft, somewhat transparent, flexible, and even elastic. If this soft gelatinous residue of B. be boiled with water, it dissolves in great part therein, and yields a solution which *sets* or gelatinizes on cooling. A more common way of extracting the gelatin from B. is to heat the bones covered with water in a digester to a temperature of 270°—280° F., when much of the gelatin dissolves out. Besides the marrow (q.v.), a little fat is generally found permeating the entire structure of the B., which can be extracted by throwing the bones into hot water, when the grease or fat exudes and floats to the surface. The marrow cavities present in the larger bones of adult man and other mammals are not found in the bones of the young animal, but gradually form as the animal approaches maturity. In the sloth, cetacea, seals, and a few other animals, the cavities are not found. Occasionally, as in man, the elephant, giraffe, etc., the bones in the head have cavities filled with air instead of marrow. The uses of bones of animals, for food, are various. In the cooking of soups, bones form a constant ingredient, supplying gelatin which gives a *body* to the soup.

B. is largely used in making the handles of small brushes, the more common table-knives and forks, and penknives, and in manufacture of the cheaper sort of combs (q.v.). B. is serviceable likewise in the arts, also certain oils and fats which are employed in forming Lamp-black (q.v.) and in the manufacture of Soap (q.v.).

BONE, HENRY, R. A.: 1755–1834: b. Truro, Cornwall: English enamel-painter. Apprenticed to a china manufacturer in Bristol, he removed to London, 1779, where he was employed in enamel-painting for lockets, brooches, etc. An enamel-portrait of his wife, exhibited at the Royal Academy,

1780 first attracted public attention; and he soon obtained a position which rendered it no longer necessary for him to continue his drudgery for the jewellers. In 1800, he was appointed enamel-painter to the Prince of Wales, a position which he retained when the prince became king; and he also stood in a similar relation to George III. and William IV. The Royal Acad. made him an Associate, 1801, and a full Academician ten years later. Between this time and 1831, when advancing years compelled him to desist from his labors, he produced a large series of works remarkable alike for their beauty and dimensions; in the latter quality they were unapproached by any former or contemporary artist. The principal are *Bacchus and Ariadne* after Titian, sold for 2,200 guineas, and now in the national gallery; the *Death of Dido; Hope Nursing Love*, after Sir J. Reynolds; *Venus*, etc. He also executed a large number of historical portraits of great merit; and altogether his name is one of the highest, if not the highest in his profession.

BONE-ASH, or BONE-EARTH: obtained by the complete combustion of bones in an open furnace, when the oxygen of the air burns away the organic matter or gelatine, and leaves the earthy constituents as a white friable mass, the size of the original bone, but readily reducible to the condition of coarse powder, which is bone-ash. A very large quantity of B. is exported from S. America to other countries. The used bone-black of the sugar-refiner also is employed as a source of B., by being heated in a furnace exposed to the air. B. of good quality contains about 80 per cent. of phosphate of lime, and 20 per cent. of carbonate of lime, phosphate of magnesia, soda, and chloride of sodium (common salt); but it is found occasionally mixed with sand, especially as procured from S. America. B. is employed to some extent as a source of phosphorus (q.v.), and in the making of cupels (q.v) for the process of assaying (q.v.); but the most extensive use is in the manufacture of artificial manures, See SUPERPHOSPHATE OF LIME.

BONE'-BLACK, or AN'IMAL CHAR'COAL, or I'VORY-BLACK: prepared from bones by heating them in close retorts till they undergo the process of destructive distillation, when combustible gases and water, together with the vapors of various salts of ammonia, and oil, are given off, and B. is left in the retort. It is generally reduced to coarse grains from about the size of small peas, down to large pinheads, and is extensively used in the arts for decolorizing liquids, such as the syrup of sugar, and solutions of argol (impure cream of tartar) and of the alkaloids, as also in filters (q.v.), for separating chemical impurities from water. The general mode of using the B. is to allow the colored liquid to percolate through a layer of the charcoal. when all color is arrested, and the syrup or water runs clear and colorless from under the stratum of charcoal. This power of absorbing coloring matters is also observable in vegetable (peat or wood) charcoal, but not to such extent as in bone-black. The application of heat to the liquids

before filtration greatly facilitates the decolorization, and where the volume of liquid to be operated upon is not great, the most expeditious method is to boil the liquid and B. together, and then strain through filtering-paper or cloth. The composition of B. in 100 parts is 10 of pure charcoal, associated with 90 of earthy salts—that is, in the proportion of 1 of pure charcoal in 10 of the commercial bone-black. The power of absorbing colors appears due to the porosity of the substance, and is not resident simply in the pure charcoal; indeed, the earthy matters (principally phosphate of lime and carbonate of lime) can be dissolved out of the B. by dilute hydrochloric acid, and the pure charcoal thus obtained possesses only about one-third the decolorizing power of the total amount of B. which it was obtained from. Thus if 100 parts of ordinary B. have the power of arresting the color from *ten* volumes of a given colored liquid, then the 10 parts of pure charcoal which can be obtained from the 100 parts of B. will be found to decolorize only *three* volumes of the same colored liquid; whence it appears that the earthy matters in the B. influence and increase the absorption of the coloring matter, and thus render a given weight of the charcoal of greater commercial value. When syrup of sugar and other liquids have been run through B. for some time, the pores of the latter appear to get clogged with the color, and the clarifying influence ceases, and then the B. requires to undergo the process of *revivification*, which consists in reheating it carefully in ovens, or iron pipes inclosed in a furnace, when the absorbed color is charred, and the B. can be of service again as an arrester of color. After several re-burnings the B. loses its absorptive capacity, and is then used for the manufacture of Bone-ash and Superphosphate of Lime (q.v.) B. has likewise a great power of absorbing odors, especially those of a disagreeable nature, and can thus be employed to deodorize apartments, clothing, outhouses, etc., or wherever animal matter may be passing into a state of active putrefaction.

BONE CAVES: see CAVES.

BONE-EARTH: see BONE-ASH.

BONE-GELATINE: see GELATINE.

BONE-MEAL; known also as Ground Bone, Bone-flour, and Bone-dust: bone reduced to fineness by crushing and grinding. It is used as a fertilizer, either directly or, after the addition of sulphuric acid, as dissolved bone (see BONES as manure), or Superphosphate of Lime (q.v.). To facilitate the process of grinding, some manufacturers steam the bones. This reduces the quantity of nitrogen, but the loss is offset by the elimination of fatty matters which would tend to prevent decomposition of the B. in the soil. The gelatinous substances are useful for the manufacture of glue, and, with the fat, nearly or quite pay the expense of steaming. B. from steamed bones contains about 3 per cent. of nitrogen and 20 per cent. of phosphoric acid. It is of special value on moist soils and for root crops.

BONER, *bō'nêr*, ULRICH. one of the oldest German fab ulists; a preaching friar of Bern, frequently mentioned in documents of 1324–49, at the period when the minnesingers and poets of chivalry had passed away. His collection of 100 fables, or 'examples,' as they used to be called, was entitled *Der Edelstein* (The Precious Stone), printed first at Bamberg, 1461. It is marked by purity of style, and by clear and vivid delineation. This book is one of the greatest of all bibliographical rarites; only one copy—that in the Wolfenbüttel Library—is known. It is decorated with wood-cuts. Bodmer and Breitinger published a complete edition of the work, Zürich, 1757.

BONES AS MANURE: valuable adjunct in modern agriculture. They are applied either simply reduced to small fragments or a coarse powder called *Bone-meal* (q.v.), or, after undergoing chemical preparations of various kinds, as the basis of highly valuable artificial manures: see BONE-ASH: SUPERPHOSPHATE OF LIME. Most of the substances of which they are composed are useful to crops, but it is their large proportion of phosphates which makes bones specially valuable for fertilizing purposes. Phosphoric acid, of which bones contain more than 20 per cent. of their weight, forms part of the structure of all animals and plants, and is indispensable to their life and growth. Though diffused through all soils, it is found only in small proportions and in comparatively insoluble forms. Unless liberal quantities of manure or fertilizer have been applied, land that has been long under cultivation is usually deficient in this element; and on grain and dairy farms, it often becomes so sparse as greatly to reduce the yield of crops in the cultivated fields, and seriously injure the pastures. The application of properly prepared bones to soils from which the stores of phosphoric acid have been drawn in too large measure by injudicious cropping or feeding, often causes great and immediate improvement. By the same means the yield of certain crops, e.g., turnips, cotton, and sugar-cane, which need large proportions of phosphoric acid, may be largely increased in soils which already contain a fair proportion of this element. B. usually give the best results as fertilizers when applied on rather moist soils; but on any kind of land, the readiness with which they act will be largely determined by the degree of fineness to which they have been reduced. If used whole or in coarse pieces, it will be several years before much of the plant-food which they contain will become available for the use of crops; and even when finely ground, both their phosphoric acid and their nitrogen (which forms 3 to 6 per cent. of their weight) are yielded rather slowly to plants. For this reason, B. are more useful for trees and for crops which have a comparatively long period of growth than for spring grains and other crops which are in the ground only a short time. But in order to make them really profitable as fertilizers, B. should in some way be thoroughly pulverized. Where there are no facilities for grinding B., which work requires

strong machinery and involves considerable expense, other methods of reducing them to fineness are sometimes employed: among these are breaking into small pieces and then fermenting them by packing in heaps of earth moistened frequently with water or urine: or by packing the pieces in fresh horse-manure, or with wood ashes kept moist by frequent turning on of water; or by packing the pieces with quicklime and ashes, and by using a solution of potash. The time required to fit B. for use by these processes varies from a few weeks to several months, according to the degree of fineness to which the bones are broken and the rapidity of the fermentation; the latter largely depending on the kind and strength of the materials employed. By any of these methods, also in the manufacture of Superphosphate of Lime (q.v.), there is some loss of nitrogen which the B. contained, but this is much more than offset by the greatly-increased availability of the remaining nitrogen and of the phosphoric acid. In manufacture of certain commercial fertilizers (see FERTILIZERS) ground bone, bone-ash, or spent bone-black is treated with dilute sulphuric acid. The resultant product is a valuable fertilizer, sometimes called dissolved bone, but in the United States known generally as superphosphate.

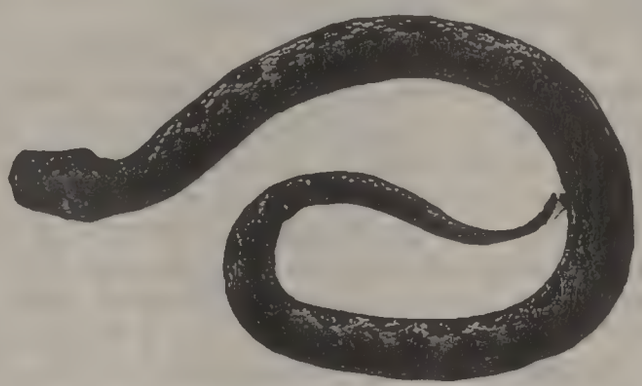
BONESET: see EUPATORIUM (THOROUGHWORT).

BONET, *bō nĕt'*, JOHN PAUL: 17th c.: a Spaniard, one of the first instructors of deaf mutes. Only one person before him had been at all successful in the art, and B. does not appear to have known of him; so that B. is really entitled to the claim of originality in his method, which consisted in imparting instruction by the sight instead of by the ear—gestures, writing, a manual alphabet, and an artificial pronunciation, being the means employed. His plan is minutely detailed in his vol. *Reduccion de las Lettras, y Arte para enseñar a hablar los Mudos*, Madrid, 1620. The manual alphabet now in use at almost all deaf and dumb institutions in Europe and America, differs little from that introduced by Bonet.

BONFIRE, n. *bŏn'fīr* [Dan. *baun*, a beacon, and *fire*]: a beacon-fire; a large fire made in the open air as a sign of rejoicing, or for display. The practice of kindling fires of this kind is of so great antiquity in England, Ireland, and Scotland, as to be traced to pagan rites: see BELTEIN. It was customary to kindle one of these fires in token of rejoicing on Midsummer Eve—the evening before June 24, which day was appropriated by the church for the feast of St. John the Baptist. The origin of the word B. has been very puzzling to etymologists. In Scotland, the popular term is *banefire* or *bainfire*, which Jamieson says is apparently a corruption of bailfire, or of *baal-fire*, which may be doubted. Skeat holds the word was first used of the fires for burning the bones of saints and other relics in the time of Henry VIII. Another etymology is the Welsh *ban*, high, whence *ban-ffagl*, a

lofty blaze, a bonfire. The hills that in English are called *Beacons*, are in Welsh *Bans or Vans*.

BONGAR, *bŏn'gâr* (*Bungarus* or *Pseudoboa*): genus of venomous serpents, allied to the genera *Elaps* and *Naja*, and distinguished by a much keeled back, which has a row of hexagonal scales larger than the rest. The head is broad and depressed, with very strong bones. The species,



Bongar, or Rock Snake.

which appear to be few—only two being certainly known—are natives of the East Indies, where they are called Rock Snakes. *B. annularis*, which has the body surrounded with rings of black and yellow, attains a length of six or eight feet.

BONGAR'DIA: genus of herbaceous plants of the nat. ord. *Berberideæ* (q.v.), natives of the East. One species (*B. Rauwolfii*) produces tubers, which are eaten, either boiled or roasted, in Persia; and the leaves of another (*B. chrysogonum*) have an acid taste and are eaten as a salad.

BONGAY, *bon-gā'*: island of the East Indian archipelago, e. of Celebes. It gives name to a group of islets, which supplies the neighborhood with slaves and wood.

BON'GO: a barbarous people of central Africa inhabiting the territory between 6° and 8° n. lat., and 27° and 29° e. long., and watered by five important tributaries of the White Nile. The B. are a short-headed race, with black hair, of red-brown complexion, and medium height. Sorghum is the grain most generally cultivated by them. They eat all kinds of reptiles and birds; and of beasts, they refuse only the dog. They raise poultry, goats, and dogs; but sheep and cattle are rare. Tobacco is everywhere raised and smoked among them. They work iron with skill, using it as currency, and for spears, knives, rings, and other useful and ornamental purposes. They take great delight in songs and instrumental music.

BONHEUR, *bō nėr'*, Rosalie (called Rosa): painter of animal life: b. Bordeaux, 1822, Mar. 22. She studied painting with her father; first exhibited in Paris 1841; has been director of the free school of design for girls in Paris since 1849; and has received decorations from the French, Spanish, and Belgian govts. Her most famous painting, *The Horse Fair* (1855), bought by A. T. Stewart,

afterward by Cornelius Vanderbilt, is in the Metropolitan Museum of Art, New York. D. 1899, May 25.

BONHOMIE, n. *bŏn′ŏm-ē′* [F.—from *bon*, good; *homme*, man]: good-nature; simplicity. BON-MOT, n. *bŏng-mō* [F. good word]: a witty saying or reply: a jest; a joke. BONS-MOTS, n. plu. *bŏng-mōz*. BON-VIVANT, n. *bŏng-vēv-âng′* [F. good living], a high feeder or liver. BONS-VIVANTS, n. plu. *bŏng-vēv-ângz′*, good companions.

BONI, *bō′nē*, or BO′NY: a state on the s.w. peninsula of the island of Celebes, in the s. Pacific ocean; formerly the most powerful state in Celebes, but since 1859 practically a Dutch dependency. In the n., the scenery is fine, and the soil fertile—rice, sago, and cassia being produced. The inhabitants engage in agriculture and in the manufacture of cotton, and articles of gold and iron, in which they have a large trade. Their institutions, said to be very ancient, partake of the character of a constitutional monarchy. The British have twice attacked the Bonese for injuring their commerce, and selling the crews of British ships into slavery. In the second attack, 1814, the Bonese king was killed. Pop. 200,000.

BONI, or BONY, GULF OF: bay separating the s.e. and s.w. peninsulas of the island of Celebes. It is 200 m. long, and 40–80 m. broad. Numerous shoals render its navigation difficult.

BONIFACE, n. *bŏn′ĭ-fās* [L. *bŏnus*, good, pleasant; *fă-cĭēs*, face, appearance]: in *familiar language*, a sleek, jolly, good-tempered landlord of an inn or tavern.

BONIFACE: name of nine popes, some of whom are of no historic note.

BONIFACE I: (reigned 418–422); appointed, contrary to canonical rule, by the Emperor Theodosius II., on account of prevailing party divisions. He was the first who assumed as Bp. of Rome the title of First Bp. of Christendom.

BONIFACE III.: pope for ten months in 607; the first to whom the title of Universal Bishop of Christendom was conceded by the Greek emperor (Phocas).

BONIFACE VIII. (previously Benedict Cajetan): native of Anagni; elected pope, 1294, Dec. 24 His inauguration was distinguished by great pomp; the kings of Hungary and Sicily held the reins of his horse as he proceeded to the Lateran, and, with their crowns upon their heads, served him at table. He failed, however, in his attempts to assert a feudal superiority over Sicily, and to exercise his papal authority in the disputes between France and England, Philip the Fair of France, supported by his states and clergy, maintained the independence of his kingdom, disregarding many bulls and briefs, and even the sentence of excommunication to which the pope proceeded. Philip at last, with the aid of Italian enemies of B., made him prisoner at Anagni, to which he had fled; and although he was liberated by the people of Anagni after two days' imprisonment, he died within about a month (1303), (as some say) of grief and mortification; as others report, in conse-

quence of having refused food during these two days, through fear of poison. He instituted the Roman jubilee in 1300. If the charges, which Philip the Fair brought against B. in self-defense—viz., heresy, simony, licentiousness, etc.—were well founded, and regarding the second there can be no doubt, Dante was not far from at least a poetic justice in giving him a place in hell. Apart from the question of his personal character, B. was undoubtedly one of those dangerous ecclesiastics in whose downfall civilization exults.

Boniface IX. (Peter Tomacelli): d. 1404: native of Naples, succeeded Urban VI. as pope at Rome 1389, while Clement VII. was pope at Avignon. He exceeded all his predecessors in the shameless sale of ecclesiastical offices and benefices, and of dispensations and indulgences. He acquired, after a struggle, a most despotic power in Rome, which he kept in awe by fortresses; but to secure himself against external enemies, particularly Louis of Anjou, whose claim to the crown of Naples he had opposed, he was obliged to give away part of his territory in fiefs, as Ferrara to the House of Este.

BONIFACE, Saint, 'the Apostle of Germany,' (original name, Winfried): abt. 680–755; b. Devonshire, England. He entered a monastery in Exeter, at the age of 13; afterward removed to that of Nutcell, where he taught rhetoric, history, and theology, and became a priest at the age of 30. At that time, a movement proceeded from England and Ireland, for the conversion of the still heathen peoples of Europe; in 614, Gallus and Emmeran had been sent to Alemannia, Kilian (murdered 689) to Bavaria, Willibrord (died 696) to the country of the Franks, Swidvert to Friesland, and Siegfried to Sweden. Winfried also took the resolution (715) of preaching Christianity to the Frisians, among whom it had as yet found no entrance. But a war broke out between Charles Martel and the king of the Frisians, and Winfried returned from Utrecht to his convent, of which he became abbot. Still bent upon his design, he repaired to Rome, 718, and received the authorization of Pope Gregory II. to preach the gospel to all the tribes of Germany. He went first to Thuringia and Bavaria, then labored three years in Friesland, and travelled through Hesse and Saxony, everywhere baptizing multitudes, and consecrating their idolatrous groves as churches. In 723, Gregory II. called him to Rome; made him bishop, with the name of Bonifacius; furnished him with new instructions or canons, and with letters to Charles Martel and all princes and bishops, requesting their aid in his pious work. Returning to Hesse (724) he destroyed the objects of heathen worship (among which are mentioned an oak near Geismar, sacred to Thor, and an idol named Stuffo, on a summit of the Harz, still called Stuffenberg,) founded churches and convents, and called to his aid priests, monks, and nuns from England, whom he distributed through the various countries. In recognition of his eminent services, Gregory III. sent him (732) the pal-

lium, and named him archbishop and primate of all Germany, with power to establish bishoprics wherever he saw fit. B. now made a third journey to Rome (738), and was appointed papal legate for German.y The bishoprics of Regensburg, Erfurt, Paderborn Würzburg Eichstädt, Salzburg, and several others, owe their establishment to St. B. The famous Abbey of Fulda is also one of his foundations. He was named Abp. of Mainz by Pepin, whom he consecrated as king of the Franks at Soissons (752), and he presided in the council held at that place. In 754 he resumed anew his apostolical labors among the Frisians; and at Dokkum, about 18 m. n.e. of Leeuwarden, in West Friesland, this venerable Christian hero was fallen upon by a mob of armed heathens, and killed, with the congregation of converts that were with him (755). His remains were taken first to Utrecht, then to Mainz, and finally to Fulda. In the abbey, there are still shown a copy of the gospels written by him, and a leaf stained with his blood. A collection of his letters, and the canons that he promulgated for the discipline of the newly established churches, have been preserved, and are instructive as to the state of Germany at the time The completest edition of the Letters (Epistolæ) is that of Würdtwein (Mainz, 1789). In 1811, a monument was erected to St. B. on a hill near Altenberga, in the principality of Gotha, where, according to tradition, he had erected (724) the first Christian church in n. Germany. A statue by Henschel was also erected to him at Fulda, 1842. See works on B. by Seiters (1845), Werner (1875), Fischer (1881), and Ebrard (1882).

BONIFACIO, *bō-ne-fâ′chō*, Strait of: modern name of the strait between Corsica and Sardinia, the *Fretum Gallicum* of the Romans. At the narrowest part, it is only 7 m. wide. The navigation is difficult, owing to the great number of rocks, which, however, are favorable to the production of coral, and the coral and tunny fisheries are actively prosecuted. At the eastern entrance of the strait lie the Bucinaric or Magdalen Islands, the *Insulæ Caniculariæ* of the ancients, principally inhabited by Corsicans, but belonging mostly to Sardinia.

The strait receives its name from the small town of Bonifacio in Corsica, strongly situated upon a rocky promontory, with an excellent harbor. It was a place of much consequence to the Genoese for the security of their trade in these seas, and a number of very fine churches still attest its former greatness. Pop. 3,300.

BONILLO, *bō-nēl′yō:* town of Spain, province of Albacete, 34 m. w.n.w. from Albacete. Pop. about 5,000.

BONIN, *bō-nēn′*, or Archbish′op, Isl′ands: in the Pacific; in n. lat. between 26° 30′–27° 44′, and in e. long. between 142°–143°. They were discovered 1827 by Captain Beechey of the *Blossom*, who took formal possession of them from England. They appear to have been then uninhabited, though previously a Japanese colony. In 1830, however, Peel Island, near the centre of the group, was

settled in connection with the whaling business, by a motley colony—an Englishman, an Italian, a Dane, two Americans, and 15 Hawaiians (5 men and 10 women), and a colony of English, Americans, and Hawaiians still remains there. Besides pigs, goats, and fowls, Peel Island produces sweet potatoes, maize, onions, yams, pumpkins, melons, lemons, tobacco, and sugar-cane. Since 1876, the islands have belonged to Japan.

BONITO, *bō nē'tō*, [Sp.]: name common to several fishes of the mackerel family, or *Scombridæ* (q.v.). One of these, *Gymnosarda pelamis*, the Stripe-bellied Tunny, but of another genus than the Albacore or Great Tunny (q.v.), is well known to sailors as an inhabitant of tropical seas, and as one of the fishes most frequently seen pursuing the flying-fish. It is often taken by an imitation flying-fish made to skim along and touch the waves. Its flesh, although relished by those who have been previously confined to salt provisions, is dry. It is rarely caught on the British coasts. It is a very beautiful fish, seldom exceeding thirty inches in length, of a beautiful steel-blue color, darker on the back, and whitish below. Four dark lines extend along each side of the belly. The general form resembles that of the mackerel, but less compressed.—The B. of the Atlantic (*Sarda sarda*) n. to Cape Cod, is very similar to this, but of an allied genus, distinguished by its comparatively large and strong teeth. It has dark transverse bars reaching obliquely forward, downward to the lateral line. It is plentiful in the Black Sea. The Plain B. (*Auxis thazard*), or Frigate Mackerel, may be distinguished at once from both of these by its more uniform blue color, without stripes or bands, and by the widely separated dorsal fins. It has only one row of minute teeth in each jaw. It is found in the Mediterranean, and in some places seems to bear, in common with the last mentioned species, the name B. Its flesh is little esteemed when fresh; it is generally used either salted or pickled. The little B. (*G. allaterrata*), rare at the n., has wavy dark streaks above the lateral line, and 5 spots below the pectoral fin; length 2½ feet.

BONN, *bŏn:* town of Rhenish Prussia, beautifully situated on the left bank of the Rhine, 15 m. above Cologne. B. is connected with the right bank of the Rhine only by a ferry, and with Cologne by the railway as well as the river. The Cathedral Church is a fine specimen of the last period of the Romanesque style, and exhibits the transition to the Gothic already begun. B. has considerable manufactures of cotton goods, earthenware, vitriol, and soap. The scenery in the neighborhood is very romantic. B. is the seat of a number of learned associations and institutions. It was Beethoven's native place. The Leopoldine Acad. of Physical Science, founded at Vienna 1652, was transferred to B. 1818. B. obtained a university 1786, which, however, was suppressed during the sway of France; and the present univ. was founded 1818, receiving from

government the former electoral palace and other buildings, with an annual revenue of nearly $75,000. There are two theological faculties, the one Prot. and the other Rom. Cath. The univ. has over 100 professors and lecturers, and 2,000 students; and among its professors have been numbered men of high distinction, as Niebuhr and A. W. Schlegel, Arndt, Welcker, Dahlmann, Hermes, and Simrock. Its clinical establishments are of unusual extent, and admirably arranged. It has a library of more than 273,000 vols., archæological and other collections, a botanic-garden, an observatory, an agricultural school, a riding-school, etc. B. derives its origin from *Bonna*, one of the castles erected by the Romans in Germany. It was long the residence of the electors of Cologne; it was taken from the French 1689 after a severe bombardment by the Elector Frederic III. of Brandenburg: and in 1703 it surrendered, after a siege, to the English and Dutch army under Marlborough. It returned again into the possession of the Elector of Cologne 1715, and in 1717 its fortifications were razed. It was acquired by France 1802, and assigned to Prussia 1814. Pop., inclusive of the military, 50,700.

BONNASSIEUX, *bō' nâ-se-ėh*, JEAN: French sculptor: b. Paunissieres, 1810; d. 1892. He studied in Paris and in 1836 received the Prix de Rome. He gained the favor of the French clergy by refusing to model a statue of Voltaire for the façade of the Louvre and thereafter did much work for churches. He was commissioned in 1857 to model a colossal statue of Notre Dame de France for the valley of Puy from the bronze canon taken at Sebastopol. Other important works of his are *Amour se conpant les ailes; David Berger*, 1814; and *Meditation*, for which last he received the cross of the Legion of Honor.

BONNAT, *bō-nâ*, LEON JOSEPH FLORENTIN: French painter: b. Bayonne, 1833, June 20. When a young man he spent several years in Spain and Italy. He studied under Madrazo at Madrid, and under Léon Cogniet at Paris, first gaining recognition at the Paris Salon in 1861, when he received a second-class medal. The list of his honors is a large one, including the medal of honor at the Salon of 1869. In the Legion of Honor he was made chevalier in 1867, officer in 1874, and commander in 1882. He paints portraits and genre subjects; many of these are reminiscences of his visits to Italy and Egypt. He became a member of the Institute in 1874, and was chosen chief professor of painting in the Ecole des Beaux Arts in 1888. His work shows the influence of Velasquez and Ribera, and his portraits, such as those of Thiers, Victor Hugo, and Don Carlos, are remarkable for their realism. He has painted the portraits of many Americans and his portrait work is well known in this country.

BONNE-BOUCHE, n. *bŏn-bŏsh* [F. *bon*, good, *bouche*, mouth]: a delicious morsel, a tid-bit.

BONNECHOSE, *bŏn-shōs*, FRANÇOIS PAUL EMILE BOIS-

NORMAND DE: French poet and historian: b. Leyerdorp, Holland, 1801; d. 1875. He was librarian of the palace of Saint Cloud for some years and subsequently held similar posts. His one notable poetical composition is *The Death of Bailly* (1833). Besides a *History of France*, he was author of *Reformers Before the 16th Century Reformation* (1844); *The Four Conquests of England* (1851); *History of England* (1859); *Bertrand du Guesclen* (1866).

BONNEMÈRE, *bŏn-mär*, JOSEPH EUGÈNE: French historian: b. Saumur, 1813, Feb. 21. In early life he wrote a number of plays; but owes his reputation to a series of historical publications, *History of the Peasants* (1856); *Vendee, in* 1793 (1866); *Popular History of France* (1874–9); *History of the Religious Wars in the Sixteenth Century* (1886); etc.

BON'NER, EDMUND, Bishop of London: born of obscure and doubtful parentage, about the end of the 15th c.; d. 1569. The reputation that he gained at Oxford by his knowledge of the canon law, recommended him to the notice of Wolsey, who promoted him to several offices in the church. After the fall of Wolsey, B. was active in the work of reformation, and received due promotion from Henry VIII. In 1533, he was deputed to appear before the pope at Marseille, to appeal for the excommunicated monarch to a general council. The violence of his threats on this occasion suggested to His Holiness the fitness of having him burned alive, or thrown into a caldron of melted lead, so that B. judged it prudent to leave Marseille without notice. In 1540, he was made bp. of London. The death of Henry cooled his Protestant zeal; and having given proofs of his lukewarmness in the cause of reformation, he was at length, 1549, committed to the Marshalsea, and deprived of his bishopric. The accession of Queen Mary restored him to office, and gave him the opportunity of revenge, which he took without delay or stint. As vicegerent and pres. of the convocation, he was the principal agent in that bloody persecution which has made the reign of Mary infamous. On the accession of Elizabeth, 1558, B. accompanied his episcopal brethren to salute her at Highgate, but was excepted from the honor of kissing her hand. In 1559, May, he was summoned before the privy council, and refused, with noticeable consistency to take the oath of supremacy. He was accordingly deposed from his bishopric, and shut up in the Marshalsea, where he died. His cruelties were many and detestable; but he dealt strictly with the lax morality of his clergy; and he bore his final misfortunes with manly resignation.

BONNER, *bŏn'ėr*, ROBERT: publisher: 1824, Apr. 28—1899, July 6; b. Londonderry, Ireland. Having emigrated to the United States, he learned the trade of a printer, and was employed on the Hartford (Conn.) *Courant* 1839. Five years later he settled in New York, bought an insignificant paper called the *Ledger* 1851, and made of it

a literary institution flourishing to this day, and bringing to its owner a great fortune. This he accomplished by making it a literary weekly of good tone and obtaining for it as writers some of the best-known authors, including Edward Everett, Henry Ward Beecher, and many others.

BONNET, n. *bŏn′nĕt* [F. *bonnet;* Gael. *boineid,* a head-dress: Ir. *boinead,* a cap—from *beann,* the top; *eide,* dress]: a cap or covering for the head of man or woman; a covering for the head worn by women; in *Scot.*, a round, worsted cap, formerly much worn by men; in *slang,* a pretended successful gambler, or a fictitious bidder at an auction, as a lure to others: V. to knock one's bonnet over the eyes. BON′NETING, imp. BON′NETED, pp.: ADJ. having one's hat or bonnet knocked over the eyes; wearing a bonnet; in *nav.*, with an additional piece of canvas made to lace on to the foot of a sail in order to make more way in calm weather. BONNET, or BONNETTE, *bŏn′nĕt* [F.]: in *fort.*, a small defense-work, constructed at the salient angles of the glacis or larger works; consisting of only two faces, having only a parapet 3 ft. high by 10 or 12 broad—without a ditch; with two rows of palisades: a patch of earth on the top of a parapet to protect artillerymen firing *en barbette*—that is, over the parapet. BON′NET-A-PRE′TRE, *-ă-prā′tr* [F., priest's cap]: a field-work, having at the head three salient and two re-entering angles, so called from its resemblance to a bishop's mitre. BON′NETS, n. plu. the cast-iron plates which cover the openings in the valve-chambers of a pump.

BON′NET: a covering for the head, of which there are many varieties. In the French, whence the word comes, it is applied (as sometimes in English) to male as well as female head-dress. The English B. of former times was made of cloth, silk, or velvet, ornamented according to the means or taste of the wearer. This species of headgear was generally superseded by the hat, in the early part of the 16th c.; but in Scotland, bonnets were universally worn for a century to two centuries later, and they remain to a certain extent a national characteristic. The genuine old B. of the Lowland Scottish peasantry was of a broad, round, and flat shape, overshadowing the face and neck, and of a dark-blue color, excepting a red tuft like a cherry on the top. The fabric was of thick milled woolen, without seam or lining, and so exceedingly durable that, with reasonable care, a single B. worth about 2*s.* would have served a man his whole life. From having been worn, till comparatively late times, by small rural proprietors—such as owners of a cottage and an acre or two of land—it gave to these local notabilities the distinctive appellation of *Bonnet Lairds.* The Highlanders have long worn bonnets of the same fabric, but these rise to a point in front, and are without any rim. Such is the cap now known as the *Glengarry Bonnet.* In France the name of bonnet-rouge was given to the cap worn as an emblem of liberty during the French Revolu-

tion. By some it is supposed to have been an imitation of the Phrygian worn by those who had obtained emancipation from slavery; by others it is said to have originated in the caps worn by some Swiss soldiers on their liberation from the galleys to which they had been condemned for insubordination to officers. After it ceased to be generally worn by the revolutionists, it became the distinctive badge of the men of the Mountain. Since the days of the Revolution it has never come into popular favor in France, but has been used as an emblem on coins and seals by several of the South American republics.

BONNET, *bŏ-nā′*, CHARLES: 1720, Mar. 13—1793, May 20; b. Geneva: naturalist and philosopher. He was educated for the law, but turned at an early age to the study of natural history. A dissertation on aphides obtained for him, 1740, corres. membership of the Acad. of Sciences, Paris. He was soon afterward occupied in researches concerning polypi, the respiration of insects, the structure of the tapeworm, etc. He published his *Traité d'Insectologie* (2 vols., Par.) 1745. His *Recherches sur l'Usage des Feuilles des Plantes*, 1754, contained the result of observation on important points of vegetable physiology. A severe inflammation of the eyes, putting a stop for two years to his researches in natural history, gave another direction to his studies, and he published several works on psychology, in which materialistic views decidedly prevail: the body is represented as the original source of all the inclinations of the soul, and all ideas are referred to movements of the nervous fibres; yet his religious convictions remained always strong and unshaken, and in his *Idées sur l'État Futur des Etres Vivants, ou Palingénésie Philosophique* (2 vols., Gen. 1769), he endeavored to demonstrate the reasonableness of the Christian revelation. In this work he also maintained the future life of all living creatures, and the perfection of their faculties in a future state. Lavater translated the last of it, and it helped to effect a change in the religious tendencies of Mendelssohn. His *Considérations sur les Corps Organisés* (2 vols., Gen. 1762) is largely given to an examination of the theories of generation. B. was for some years a member of the Great Council of his native city. In the latter part of his life, he superintended a collective edition of his own works (8 vols. and 18 vols., Neuch. 1779–88).

BON′NET-PIECE: gold coin of James V. of Scotland, so called on account of the king's head being decorated with a bonnet instead of a crown, as was usual. It was struck by James V. and dated 1539. James V. was the first Scottish sovereign who placed dates on his money, and was the first who diminished the size of the gold coin, by increasing their thickness. The bonnet-pieces in beauty and elegance of workmanship, approach the nearest to the Roman coins, and very much surpass all the coinage at that period, or ever since. These bonnet-pieces are among the most valued curiosities of the antiquary.

BONNEVAL, *bŏn-vâl'*, CLAUDE ALEXANDRE, Count DE (called also Achmed Pasha): 1675–1747, Mar. 27; b. Coussac, Limousin, of a noble family: French adventurer. He was found unmanageable at the Jesuit College; and was placed in the Royal Marine Corps in his 13th year. He was transferred to the Guards; served with great distinction in Italy and the Netherlands; but having been refused promotion, on account of some excesses, he behaved with great insolence to the minister at war, and was therefore condemned to death by a court-martial. Foreseeing this result, he fled to Germany, where, upon the recommendation of Prince Eugene, he obtained employment in the Austrian service. He now fought against his native country, distinguished himself by any daring exploits, was raised to the rank of lieut. field-marshal, and bore a principal part under Prince Eugene in the war between Turkey and Austria. But when residing at Vienna, after the peace of Passarowitz, he made himself very disagreeable to the prince, and was therefore sent, 1723, as master-gen. of ordnance, to the Netherlands, where he soon made a scandalous quarrel with the governor, and was brought to trial, and condemned to death by a court-martial. The emperor commuted the sentence to one year's imprisonment; and upon condition of never again setting foot upon German soil, he was conveyed across the Tyrolese frontier. He went to Constantinople, was cordially welcomed, became a Mohammedan, took the name of Achmed, was made a pasha of three tails, was employed in organizing the Turkish artillery after the European manner, achieved successes as general of a division of 20,000 men, in the war of the Porte with Russia, and arrested the victorious career of the Persian usurper, Thamasp Kuli Khan. For this service, the sultan appointed him gov. of Chios, but his own imprudence, and the envy of others, caused his removal from this office. He died at Constantinople. The memoirs published as his are spurious.

BONNEVILLE, *bŏn'vil*, BENJAMIN L. E.: 1795?–1878; b. France: American soldier and traveller. He graduated at West Point Military Acad., and received the appointment of lieut. of artillery, U. S. A. In 1820, he was employed in building a military road through Mississippi; and from 1831–36, in exploring the Rocky Mountains and California. He fought with gallantry in the Mexican war, taking part in the siege of Vera Cruz, the battle of Cerro Gordo, the capture of San Antonio, battle of Churubusco, where he was wounded, the battle of Molino del Rey, the storming of Chapultepec, and the ensuing assault and capture of the city of Mexico. In 1857 he commanded the Gila expedition, and in 1861 was retired from active service, 'for disability resulting from long and faithful service, and from sickness and exposure in the line of duty.' From 1862–65 he was commandant of the Benton Barracks in St. Louis, and in the latter year was brevetted brig.gen. for his gallantry and fidelity during a long ser-

vice. B. published a *Journal of an Expedition to the Rocky Mountains.* Washington Irving published, 1837, *Adventures of Captain Bonneville.*

BONNEVILLE, Lake, a lake of the Pleistocene epoch that twice filled a now desert basin of Utah. At its greatest dimensions it had an area of 20,000 square miles, and was 1,000 feet deep.

BONNEY, *bŏn'nĭ*, Charles Carroll, American lawyer: b. Hamilton, N. Y., 1831, Sept. 4; d. Chicago, Ill., 1903. In 1850 he removed to Peoria, Ill., took an active part in establishing the present educational system of that State; was admitted to the bar 1852, settled in Chicago in 1860, and acquired a large and successful practice. He was one of the originators of the law and order movement and was president of the National Law and Order League 1885–93. In 1893 he was the organizer and general president of the World's Congresses held at the Columbian Exposition; there were over two hundred of them, and they proved a marked feature of the World's Fair. Besides numerous pamphlets, addresses and essays on public questions he has written *Rules of Law for the Carriage and Delivery of Persons and Property by Railway* (1864); *Summary of the Law of Marine, Fire, and Life Insurance* (1865); *Our Remedy in the Laws* (1887); and edited A. W. Arrington's *Poems* (1869).

BONNEY, Thomas George, English geologist: b. Rugeley 1833, July 27. He was president of the Geological Society of London 1884–6, and in 1899 became vice-president of the Royal Society. He has written *Outline Sketches in the High Alps of Dauphine* (1865); *The Alpine Regions* (1868); *The Story of Our Planet* (1893); *Charles Lyell and Modern Geology* (1895); *Ice Work* (1896); *Volcanoes* (1898), and four volumes of Sermons.

BONNIE BLUE FLAG: a popular Confederate ballad first sung in public at the Varieties Theatre in New Orleans in 1861.

BONNIÈRES, *bŏn-nĭ-äar*, Robert de: French journalist and novelist: b. Paris, 1850, April 7. He began his literary career as contributor to Paris journals of spirited but waspish biographies of contemporary men; these were collected and published in three successive volumes of *Memoirs of To-Day.* His novels are full of transparent allusions to noted persons, and have had a very great vogue. In one of them, *The Monarch,* he portrays high Jewish society in Paris.

BONNIVARD, *bō-ne-vâr'*, Francis de: 1496—1570; b. Seyssel, France: historian and the hero of Byron's *Prisoner of Chillon:* educated at Turin, and became prior of St. Victor near Geneva, 1510 (at the age of 14 years). An ardent republican, he took sides with the Genevese against Duke Charles III. of Savoy. Having fallen into the hands of robbers who delivered him into the power of the Duke of Savoy, he was imprisoned (1530) in the castle of Chillon.

The Genevese aided by the Bernese effected his liberation (1536). The last four years he had spent in horrid dungeons, where, by his monotonous and perpetual walking, he had worn a deep channel into the rock that formed the floor of his wretched abode. On his return to Geneva, now entirely liberated, he enjoyed the honors due to his patriotism, and was made one of the Council of Two Hundred. He wrote a history of Geneva, and other works; and has sometimes been called the Montaigne of the Rabelais of Geneva.

BONNY, a. *bŏn′nĭ* [Scot. *bonny* or *bonnie*, beautiful—from F. *bon* or *bonne*, good—from L. *bonus*, good: Gael. *bân*, fair, white]: handsome; beautiful; merry: N. a distinct bed of ore which has no communication with a vein. BONNIBELL, n. *bŏn′nĭ-bĕl′* [F. *belle*, handsome]: in *OE.*, a handsome or beautiful girl. BON′NILASS, n. *-lăs* [Scot. *lass*, a maid, a sweetheart]: in *OE.*, a beautiful maid.

BONNYCASTLE, *bon′e-kas-sĕl*, CHARLES: mathematician: 1792–1840; b. Woolwich, Eng., son of John B., prof. of mathematics at the Military Acad. at Woolwich. He contributed articles to cyclopedias and periodicals, and assisted his father in compiling mathematical text-books. When the Univ. of Virginia was organized, 1825, he took the chair of natural philosophy, and two years later that of mathematics. He published, beside a number of other mathematical works, a treatise on *Inductive Geometry* (1832).

BONNYCASTLE, JOHN: b. Whitchurch, Buckinghamshire; d. Woolwich, 1821: long prof. of mathematics at the Royal Military Acad., Woolwich. He is known as the author of many excellent elementary works, chiefly mathematical. His *Elements of Algebra* (2 vols. 8vo, 1813) is specially commended.

BONNYCASTLE, SIR RICHARD HENRY, English military engineer: b. 1791; d. 1848. He was a brother of Charles Bonnycastle (q.v.) and spent the greater part of his life in British North America. He was author of *Spanish America* (1818); *The Canadas in* 1842 (1842); *Canada and the Canadians in* 1846 (1846); and *Canada as It Was, Is, and May Be* (1846).

BONNY-CLABBER, n. [Ir.]: sour buttermilk. In the U. S. thick sour milk.

BON′NY RIV′ER: river of Guinea, w. Africa, forming the e. debouchure of the Niger, and falling into the Bight of Biafra, about lat. 4° 30′ n., and long. 7° 10′ e. It is accessible at all times of the tide to vessels drawing 18 ft., and safe anchorage at all seasons of the year is found within its bar. Its banks are low, swampy, and uncultivated. On the e. side, near its mouth, is the town of B., long notorious as the rendezvous of slave-trading ships. It exports considerable quantities of palm-oil.

BONOMI, *bō-nō-mē*, JOSEPH: Egyptologist: 1796–1878, Apr. 3; b. London; son of Giuseppe B. (1739–1808). B.

gained two silver medals when student at the Royal Acad. From 1824 he spent 15 years in Egypt and the East, studying hieroglyphics. He was artist of the Prussian expedition to Egypt under Dr. Lepsius, 1842, and curator of the Soane Museum from 1861 till his death. His works are, *Nineveh and its Palaces; Discoveries of Botta and Layard applied to the Elucidation of Holy Writ*, 1852, etc.

BONONCINI, or Buononcini, Giovanni Batista, *jō-vân′ne bō-nŏn-chē′ne*, Italian composer: b. Modena about 1660; d. about 1750. His proficiency on the violoncello gained him admittance into the band of the Emperor Leopold at Vienna, where, at the age of 18, in emulation of Scarlatti, he wrote an opera called *Camilla*, which was favorably received. In England for several years scarcely any opera was tolerated which did not contain some of Bononcini's airs, and upon the almost simultaneous arrival of himself and Handel in London, notwithstanding the superiority of the latter, two parties, the one for Bononcini and the other for Handel, were formed, between whom an exciting contest was waged for several years. Gradually, however, Bononcini's popularity waned, and having been detected in an act of musical plagiarism, he left England in 1733, found his way to Paris and Vienna, and finally went to Venice.

BONONCINI, Giovanni Maria, Italian musician: b. Modena, 1640; d. 1678, Nov. 19. He was educated at Bologna, was in the service of the Duke of Modena, Francis II., and also maestro di capella of San Giovanni in Monti. He was considered an authority on the theory of music on account of his work *Musico prattico;* he also wrote numerous musical compositions.

BONONE, *bō-nō′nā*, Carlo, Italian painter: b. Ferrara, 1569; d. 1632. He studied the works of the Caracci and Veronese, and shows the influence of both styles in his own work. He taught painting in Ferrara. Among his paintings are *The Arisen Christ* and *Patriarchs and Prophets.*

BONPLAND, *bōng-plŏng*, Aimé: 1773, Aug. 22—1858. b. La Rochelle, France: botanist. Having studied medicine and botany at Paris, he accompanied Alexander von Humboldt, 1799, to America, where they travelled nearly five years, mostly in Mexico and the Andes, during which time B. collected 6,000 new species of plants. After his return, he was appointed, 1804, director of the gardens at Navarre and Malmaison, and published several splendid and valuable botanical works, *Plantes Equinoxiales Recueillies au Mexique*, etc. (2 vols., Par. 1808–16, with 140 copperplates); *Monographie des Mélastomées*, etc. (2 vols., Par. 1809–16, with 120 copperplates); and *Description des Plantes rares de Navarre et de la Malmaison* (11 numbers, Par. 1813–17, with 64 copperplates). He went to Buenos Ayres 1816, with a collection of European plants and fruit-trees, was favorably received by the government, and named prof. of natural history. After remaining at Buenos Ayres about five years, B. undertook an expedi-

tion of scientific discovery up the Paraña, with the view of prosecuting his investigations to the Andes, across the Gran Chaco Desert; but Dr. Francia, then dictator of Paraguay, instead of giving him permission to cross the country, arrested him, after killing some of his men, and kept him prisoner for about nine years, notwithstanding the efforts of the British government, at the instigation of Humboldt, to obtain his release. While detained by Dr. Francia, he acted as physician of a garrison. He obtained his liberty, 1831, Feb. 2, and travelling southward, settled on the s. boundary of Brazil, near the e. bank of the river Uruguay, and in the vicinity of the small town of San Borja. Here he resided till 1853, taking great interest in cultivating and promoting the cultivation of Paraguay tea, and with no desire to return to Europe. In 1853, he removed to a larger estate at Santa Anna, where he busied himself in cultivating orange-trees of his own planting. In 1857 he wrote to Humboldt that he was about to carry his collections and manuscripts to Paris, to deposit them in the Museum there, and that after a short stay in France, he intended to return to Santa Anna; but his voyage was prevented by his death. His remarks on the herbarium collected in his travels with Humboldt have been given to the world by Kunth in his *Nova Genera et Species Plantarum* (12 vols., Par. 1815–25, 700 plates). See Life by Brunel (3d ed., Par. 1872).

BONSPIEL, n. *bŏn'spēl* [Belgic, *bonne*, a district; *spel*, play]: a district curling match: see CURLING.

BONTEN, n. *bŏn'tėn:* a narrow woolen stuff.

BON-TON, n. *bŏng'tŏng'* [F.]: good fashion; the height of fashion.

BONUS, n. *bō'nŭs* [L. good]: a consideration for some service done; a premium for a loan; an extra dividend to shareholders; a division of the profits of an assurance office to its policy-holders. A *bonus*, in case of extra profits, takes the place of a formal dividend, as it does not commit the company to a like dividend in future.

BONY: see under BONE.

BONYHAD, *bŏn-yŏd'*, or BONHARD: market-town of Hungary, county of Tolna, 20 m. n.e. from Fünfkirchen. Pop. (1880) 5,970.

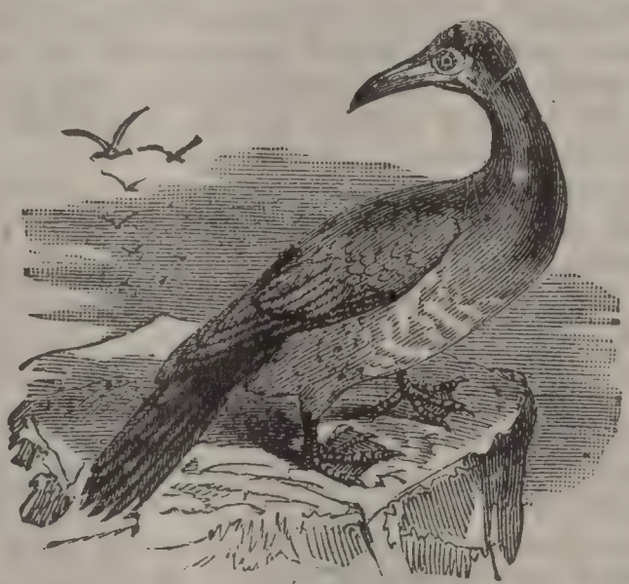
BONY PIKE (*Lepidosteus*): interesting genus of fishes, one of the few existing genera belonging to the order, Ganoid Fishes (q.v.) Other names are Gar and Gar-pike, but not Gar-fish (q.v.) The Long-nosed B. P. or Gar-pike (*L. osseus*), attains 5 ft. length and is found from the Great Lakes to Mexico; the Short-nosed Gar-pike (*L. platystomus*) is found in the Mississippi valley; the Alligator Gar (*L. tristœchus*), 10 ft., from Ill. to Cuba; all are covered with rhombic enamelled plates. The vertebræ are articulated by ball and socket, and the head is capable of a degree of motion upon the trunk very remarkable among fishes, and compensating for the general stiffness of the mailed body, the skeleton

of which is also bony, and not cartilaginous. The snout is elongated, and the edges of the jaws are furnished with long teeth, the breadth of the snout in some of the species giving it a resemblance to that of the pike. The tail is *heterocercal*, or unsymmetrical, the caudal rays being inserted not equally above and beneath the termination of the vertical column, but only at and beneath it, a character much more common in fishes of the old red sandstone than in those of the present period.—The species of this genus are moderately numerous, attain a large size, and are found in the rivers and lakes of the warm parts of America.

BONZE, n. *bŏnz*, plu. BONZES, *bŏn'zĕs* [an alleged corruption of Japanese, *busso*, a pious man; *bozu*, a priest: F. *bonze;* Port. *bonzo*, a bonze]: a name given by Europeans to the heathen priests of Japan, China, etc.: see JAPAN: BUDDHISM.

BOOBY, n. *bo͞o'bĭ* [Sp. *bobo*, foolish: It. *babbeo*, a simpleton: Gael. *bùb*, to roar: F. *badaud*, a dolt—from OF. *badau*—from mid. L. *badārĕ*, to gape]: one who gapes in wonder; a dunce; a stupid fellow; a pupil at the foot of a form or class; a water-bird of the gannet tribe.

BOO'BY (*Sula fusca*): species of Gannet (q.v.), which has received this name from its apparent stupidity in allowing itself to be knocked down with a stick or taken by the hand. Accounts differ much, however, as to this character of the B., some representing it as singular in not taking alarm or becoming more wary even when it has had reason to apprehend danger from man; others, as



Booby.

Audubon, asserting in such a manner as apparently to place it beyond dispute, that it does learn to be upon its guard, and even becomes difficult to approach within reach of shot. The B. is not quite so large as its congener, the common gannet or solan-goose, and, like it, is a bird of powerful wing, and feeds on fish, which it takes by diving into the sea, observing its prey as it sweeps

along in graceful and varying flight, sometimes at a height of only a foot or two from the surface of the water, sometimes twenty yards above it, and plunging suddenly to seize it. It is sometimes taken, like the gannet, by means of a fish fastened to a board, through which it drives its bill, as it dashes at the bait. The B. is of a blackish-brown color, whitish beneath; its colors are subject to some variation, and in young birds a general brown color prevails; the sexes differ very little, except that the female is not quite so large as the male. It is found on almost all tropical and sub-tropical shores, and sometimes even 200 m. from land. On the e. coast of N. America, it reaches about as far n. as Cape Hatteras, but is much more abundant further s., great numbers breeding on the low islands off the coast of Florida. The nest is often placed upon a low bush, and 'is large and flat, formed of a few dry sticks, covered and matted with sea-weeds in great quantity.' It contains only one egg or young one at a time. The expansibility of the gullet enables the B. to swallow fishes of considerable size. The bill, which is straight, conical, and longer than the head, opens beyond the eyes, as in the rest of this genus. The B. is much persecuted by the Frigate Bird (q.v.) and Man-of-war Bird (q.v.), more powerful birds and of swifter flight than itself, which often compel it to disgorge for their use the prey which it has just swallowed. The flesh of the B., though sometimes eaten by sailors, is dark-colored and not very agreeable. See GANNET.

BOO'BY ISL'AND: a level rock in Torres Strait, in lat. 10° 36′ s., and long. 141° 53′ e.; 3 ft. in height, and ¼ m. in diameter. Being, of course, highly dangerous to navigators, and destitute of resources of its own, it is said to be with some regularity supplied with provisions and water by passing vessels, for the benefit of such as may be cast ashore on it.

BOODHISM: see BUDDHISM.

BOODLE, n. *bôd'l* [origin doubtful: if from D. *boedel*, estate, household possessions, stuff, it denotes 'the whole lot,' then 'the whole company']: term of contempt or of slight for a crowd, gang. In *recent slang*, money gained in any of the many ways of defrauding the public; e.g., by bribery of officials, selling of votes, collusive contracts, etc.: also counterfeit money.—See CABOODLE.

BOODROOM, BOUDROUM, *bo-drôm'*, or BODRUN, *bo-drôn':* seaport town of Asiatic Turkey, pashalic of Anatolia, finely situated on the n. shore of the Gulf of Kos, about 96 m. s. of Smyrna, in lat. 37° 2′ n., and long. 27° 25′ e. It is an uninviting place, its streets being narrow and dirty, and its bazaars of the worst class: but as the site of the ancient *Halicarnassus*, the birthplace of Herodotus and Dionysius, it possesses great interest for the traveller. Many remains of the old city, 'the largest and strongest in all Caria,' bear witness to its former magnificence. A fortress, built by the Knights of Rhodes, 1402, occupies a projecting rock on the e. side of the harbor. Pop. about 5,500.

BOOK, n. *bûk* [AS. *boc*, a beech-tree, a book: Goth. *boka*, writing; *bokos*, the Scriptures: Ger. *buch;* Icel. *bok*, a book; originally identical with *beech—lit.*, a prepared tablet of beech-wood for writing on]: printed sheets of paper stitched and bound together; a volume or part of a volume; a division of a subject; a register of transactions, as of a trader, etc.: V. to enter or write in a book. BOOK'ING, imp. registering in a book: ADJ. applied to the office at a railway station where the tickets are sold to travellers. BOOKED, pp. *bûkt*, entered in a book as a passenger by rail, coach, or steamer in virtue of possessing a ticket as an evidence of fare paid; in *familiar slang*, fixed; disposed of. BOOK'LESS, a. without a book. BOOK'-BINDER, n. one whose trade it is to cover the sewed leaves of a book with boards and leather. BOOKBIND'ING, n. the art or process of covering books with boards, or with boards and leather. BOOK-DEBT, money due to a tradesman or dealer for work done, or for goods, as recorded in his books. BOOK-KEEPER, n. the clerk who has the charge of the business books; an accountant. BOOK-KEEPING, n. the method of entering sales of goods, and all kinds of transaction in business, in books in a regular manner. BOOK-LEARNED, a. *-lĕrn'ĕd*, well read in books. BOOK-LEARNING, n. that obtained from books only. BOOK-CASE, n. a case for holding books. BOOK-MADNESS: see BIBLIOMANIA. BOOK-NAME, n. in *bot.* and *zool.*, a name found only in scientific books, and not in use among the people at large. BOOKSELLER, n. one who deals in books. BOOKSTAND, or BOOKSTALL, n. a stand in an open place, or on the street, on which are placed books for sale. BOOK-WORM, n. an insect destructive to books; one too much given to books. BOOK'ISH, a. *-ĭsh*, given to reading; acquainted only with books. BOOK'ISHLY, ad. *-lĭ*. BOOK'-ISHNESS, n. much devotion to the reading and study of books. BOOK'LAND, n. [AS. *bocland*]: charter land, held by deed under certain rent and services. WITHOUT BOOK, by memory. IN BOOKS, in good or bad favor, as having name in the will. TO MAKE A BOOK, in *betting transactions*, to enter in a pocket-book, made for the purpose, all the bets made by a person for and against a race. NOT SUIT MY BOOK, does not accord with my other arrangements. MAKING A BOOK, the arrangement of a person's bets as entered in his pocket-book. BOOK-MATE, a schoolfellow. BRING HIM TO BOOK, to make him give an account or reckoning.

BOOK, the names of sizes of: see under PAPER.

BOOK: Used without qualification, the term currently implies a printed literary composition in many sheets; but in law and custom it has received three extensions, one of form and two of matter. The form includes anything bound like a book—volumes of accounts, or of blank leaves for keeping them or for indexing, etc., and even 'books' of gold-leaf, 25 thin strips in a cover. The matter includes—by English statute law, 'every volume,

part or division of a volume, pamphlet, sheet of letter-press, sheet of music, map, chart, or plan separately published'; in literary usage, the written compositions of ancient times on whatever material, if one of some volume.

The word book is from the Angl.-Sax. *boc*, and, with some modifications of spelling, is common to all the Teutonic and Scandinavian languages (Ger. *buch;* Dutch, *boek*). It is believed to be derived from the same root as *beech* (Angl.-Sax. *boc;* Ger. *buche;* Icel. *beyke;* Dutch, *beuke*), the earliest writing among those nations having been executed on the inner bark of the beech-tree, or perhaps carved on beech boards. The Greek word for a book, *biblos*, or, more commonly, *biblion*, is derived from the Egyptian appellation for the plant papyrus. The Latin word *liber*, a book, is derived from the name of the cellular tissue of the papyrus, instead of the plant itself. The Babylonian and Assyrian books were drawn on clay tablets or polygonal cylinders (afterward hardened) with an iron stylus, producing the wedge-shaped or 'cuneiform' characters, some of them so small and skilfully executed that they suggest the use of a magnifying glass—quite likely a ball of crystal. These about the 7th century had begun to be gathered into royal or temple libraries. Papyrus (q. v.) was the material used by the Egyptians for book-making; of these Egyptian books one of the most famous is the *Papyrus Prisse*, dating perhaps more than 2,000 years before Christ, and containing the still older composition, the 'Maxims of Ptah-Hotep,' dating probably from 2500 B.C. From Egypt the use of papyrus spread to Greece before the time of Herodotus at least, and to Rome, and was used more or less as a book material down to the 10th century A. D. Parchment, a fine dressed skin, used by the Jews, Persians, and other Oriental nations, was also employed by the Greeks and Romans, and gradually superseded papyrus, especially for public documents. Paper-pulp and skin and clay were not the only materials used for books by the ancients; in fact, it would be hard to cite any common smooth-surfaced article not so used. Animal, vegetable, and mineral substances have all been drawn on; metals, wood, wax, ivory, leaves, bark, etc. Wooden books were common among both Greeks and Romans; part of one containing Solon's laws was preserved at Athens till the 1st century. For the more important purposes, laws and edicts, they employed (before the general accession of parchment) ivory, bronze, etc. The shape of wooden and metal books, waxen and ivory tablets, and those of other hard substances, was square; but the papyrus was written on one side only, fastened together at the edges, and glued or otherwise attached to the roller, which was called in Egyptian a *tama*, in Greek a *kulindros* (cylinder), in Latin a *volumen* (roller), our 'volume.' Some of these rolls were of huge size, but certain handy sizes became normal, like the ordi-

nary volume of to-day. At each end of the roller was the *umbilicus* (navel) or *cornus* (knob), a boss to turn it by, and the volume was read by unrolling the scroll to expose successively the sheets or *paginæ* (things 'fastened' together). In Egypt the rolls were kept in jars holding nine or ten each; in Rome they were kept in wooden boxes or canisters, often of costly workmanship, or in parchment cases. Some parchments were also arranged in this form, but the change from scrolls to *codices*, or square books, seems to have taken place generally in the ancient world after the adoption of parchment or vellum; they appear to have been coming into general use in Martial's time (last half of the 1st century A.D.), as he alludes to their advantages. The form remained substantially unaltered throughout the Middle Ages, and being even more suitable for paper than for vellum, was ready on the invention of printing to facilitate its full development; though important differences in bulk, arising as well from the condition of the art and its materials as the fashion of the times, distinguish books of the earlier periods of printing from those of to-day.

In producing books during the Middle Ages, the material employed was still parchment, prepared from the skins of goats, sheep, deer, and other animals; for though the art of making paper was known in the 9th c., this new material came slowly into use. The fabricators of the books were for the most part different orders of monks, particularly the Benedictines (q. v.). At the head of the book-manufacturing department in the monastery was the *armarian*, who, beside taking charge of the library, gave out books to be copied, along with the pens, ink, and parchment required by the transcribers. Some of the monks were allowed to transcribe in the solitude of their cells, but the business of transcription was conducted chiefly in an apartment called the *scriptorium*, provided with ranges of desks and forms. There, the scribes or copyists, who were under strict regulations as to keeping silence, carried on their tedious but useful labors. The writing was effected in distinctly formed letters in an old character; regularity in the lines and pages being secured by previous ruling. There was a division of labor in the monasteries. To some of the monks was assigned the duty of throwing in embellishments. With leaf-gold and brilliant water colors, they adorned the devotional works, lives of saints, and copies of the Scriptures with pictorial illustrations and fancifully illuminated letters at the beginning of chapters. By another class of these monkish artists, the books were bound in styles suitable to the quality of the works. In many instances, the binding was superb. The boards of wood, covered with leather or velvet, were decorated with precious stones and devices in metal; and in front, the volume was held together with clasps of gold or silver-gilt. Books of a common quality were plainly bound in parchment and tied in

front with thongs. Among the works produced were copies of the Scriptures, books of prayer, psalters, copies of the Greek and Latin classics and of the church fathers, also to a less extent legends of the saints, poetry, romance, and the books of history known generally as chronicles. Some of the books were sold at exorbitant prices, some were executed to the order of kings, nobles and church dignitaries, some were exchanged and some found their way into the hands of the *stationarii*, or dealers in books, in the principal cities. It was customary to lend books for transcription, under an agreement to receive an additional copy on their return. In all cases of lending books, penalties were stipulated to be paid in the event of their not being restored. The establishment of universities in the 12th c. greatly stimulated the manufacture of books by transcription, more particularly those classics and philosophical treatises that were required by students in the colleges. The anxiety of the authorities in these schools of learning to insure accuracy in the text-books, as well as to prevent the use of books of an improper kind, led to the establishment of censorships and privileges which interfered with the preparation of, and traffic in, books, long after the invention of printing. With the invention of printing in the 15th c. began the development of the modern book and the modern business of publishing (see BOOK TRADE: PRINTING). For a time, naturally, the production of printed books and the work of transcription of MSS. went on simultaneously, until the new art was fully established. Unfortunately during the development of printing the convulsions consequent on the Reformation caused an enormous destruction of books. In England the libraries of monasteries, representing the labor of a thousand years, were mercilessly destroyed on the spot, or carried off and consumed in base uses, without a thought as to their value. In Scotland, the monastic libraries which had escaped the ravages of Danish and other invaders, were similarly destroyed. The same fate overtook the ancient monastic libraries of France at the Revolution. See LIBRARIES. In consequence of these deplorable events, as well as the perishableness of books, copies of works prior to the invention of printing exist only as rare and valuable curiosities. Even of the early printed books, there are comparatively few copies extant.—In proportion as literature has been popularized books have diminished in bulk and costliness.

The Modern Book: Arrangement:—The first page or *recto* of the first leaf or 'folio' is technically known as a bastard or half-title page; the next page or *verso* of the first folio is left blank. (The term 'folio,' however, as usually employed by printers, means simply page number.) Then follows the title-page proper, usually with a blank page at the back. In many books there intervenes a preface or introduction, a dedication, and a table of contents, before the main body of the book begins; the table of contents is sometimes before and sometimes after the

introduction and preface. If any portion of the book is out of place, there are two ways by which the true order may be discovered. At the outer corner, or in the center above the reading matter, or in pages with a chapter heading, is a numeral either Arabic or Roman—1, 2, 3, or I, II, III; the almost universal custom now is to use the Roman numerals for prefaces and introductions, and the Arabic for the body of the text. As a guide to the binders in gathering the sheets, also, each 'form' as printed on the press—the number of pages printed on one sheet, to be folded and cut later into the proper order of reading—has at the bottom of its first page a number or letter in sequence through the book; that is, if each sheet as printed has eight pages on it, then pages 1, 9, 17, etc.,—the *outside* sheet of each form, which lies on top and visible when the sheet is builded,—will have the numbers 1, 2, 3, etc., or the letters A, B, C, etc., called 'signatures,' to show the binder in what order the folded sheets are to be assembled. If the forms outnumber the letters of the alphabet when these are used, the signature series continues either as AA or 2A, etc.

Sizes.—The copyists made up their paper or vellum books by folding four, five, or six sheets and placing one within the other, making quires or gatherings of 8, 10, or 12 leaves. The first printers adopted the same method, printing one page at a time and only on one side of the sheet. When more than one page was printed at once, the number of times the paper had to be folded was a fair guide to the dimensions of the page, at a time when (and for ages later) the paper was made by hand, on frames whose size was held closely alike by the exigencies of human arms; and folio, quarto, octavo, duodecimo, etc., expressed not only the absolute fact of folding, but the constructive fact of size. These terms, except the first, were conveniently abbreviated to 4to, 8vo, 12mo; and when improved machinery and larger sheets of paper enabled still more sheets to be printed at once, the terms 16mo, 24mo, 32mo were immediately employed. All these terms still survive, but with the advent of machinery which can make paper of any size, and the actual printing on large editions of 64 pages at a time, they do not express any fact of importance, so that in the U. S. the size is usually indicated in catalogs by giving the height and breadth of the pages. But in Europe the old fashion still prevails. So far as the names now mean anything, a 16mo indicates the usual size of a popular volume or essay volume, and an octavo the stately and dignified memoir or volume of travel or 'complete works' or cyclopædia.

Pagination.—Books were printed at first exactly like manuscripts, without numbering the pages. Soon the unhandiness of this method, and the difficulty of making references, forced a numbering of the leaves; which was shortly succeeded by numbering the pages, and in some cases—of very large, closely printed books—by numbering the columns, which is occasionally done

for like reasons in modern times. Books of more than one volume are usually paged separately, but in many large sets the paging is carried consecutively from beginning to end, especially where it is likely to be issued in more than one edition and divided into differing numbers of volumes; since in that case one index will answer for all, instead of having to be made over for each.

BOOKBINDING: the art of arranging, fastening together, and covering sheets of paper composing a book, including the ornamentation or decoration of the covers. Following the use of rolls of papyrus or wax-covered tablets, leaves of parchment were introduced, and it became necessary to fasten or bind them together. This improvement in form is, on somewhat doubtful authority, attributed to Attalus II., king of Pergamus, about 150 B.C. The bookbinding of the Middle Ages up to the time of the invention of printing was done almost exclusively by the monks; and great labor was bestowed on the covering of their most precious manuscripts. One of the oldest specimens existing is the St. Cuthbert Gospels in the British museum, bound about A. D. 700. It is covered with velvet heavily ornamented with silver inlaid with gems. All monastic binding has the same characteristics of heavy boards with strong metal clasps and bands, though the materials varied from the plainest parchment and iron to ivory, enamels, and mosaics with jewelled silver and gold. The invention of printing and the dawn of the Rennaissance wrought a revolution in B. The contrast between the clumsy, inartistic productions of the monasteries and the masterpieces of taste and beauty from the library of Jean Grolier (q.v.) is sharp and striking and no productions of later times have surpassed in artistic beauty the work of these nameless Italian and French binders employed by Grolier, Maioli, and others. The most important event in the art of B. since the invention of printing was the introduction of cloth for covering, 1820-30, by John Pickering, a London publisher, and Albert Leighton, a bookbinder. The use of cloth aided greatly in the multiplication of cheap books, not only on account of the cheapness of the materials, but also because the process of binding allowed a much greater use of machinery than in the case of books bound in morocco.

Bookbinding may be divided into two classes, 'Extra work,' i.e., books bound with extra care, and by hand methods which are still very similar to those employed 300 years ago, and 'Edition work,' done principally by machinery in large quantity.

EXTRA WORK.—The book comes from the printer in flat sheets of 8, 16, 24, or 32 pages each, which are folded by girls with an ivory folder, so that the pages come in consecutive order. Piles of the folded sheets, now called *signatures*, are next laid in regular order on a long table and a girl picks up one of each signature as she passes along, making a complete book when she reaches the end, the process being called *gathering*. The book is then

collated, that is, examined to see that no signature has been omitted or duplicated; this is done very rapidly by bending the book so that the signature number, which is on the lower left-hand corner, can be seen. In order to make the book solid, it is next beaten with a heavy, broad-faced hammer, or subjected to pressure in a press.

Sewing is done on a frame called a *sewing-bench*, on which bands or cords are stretched in a vertical position, and to these the signatures are attached by passing the needle and thread through the middle of the signature and around each band or cord, the number and location of these cords being shown on a bound book by the raised bands on the back. In most work at the present time grooves are sawed in the backs of the books, into which the cords fit, and the raised bands usually seen on the backs of fine books are put on by strips of pasteboard before the leather is drawn on.

The book is taken down from the sewing bench and an inch or more of twine is left on each side to be later laced through holes punched in the boards. Before this is done the marble or colored linings are pasted on the front and back of book inside the first fly leaf. Leather or cloth joints in some cases are added.

The book is then trimmed in a cutting or trimming machine; formerly the edges were trimmed by a knife called a plow while the book was clamped firmly in a press. Before cutting the back is struck forcibly against an iron plate, to square up the signature,then placed against gauge, set to position desired and clamped, knife descending and cutting book while under pressure. After trimming the three sides the book is again carefully knocked up and a thin coating of glue, sometimes flexible in character, is well rubbed in between signatures, for unless this is done the signatures will show a tendency to split open, where one signature joins another. The book is then rounded by drawing or shaping the curve, at same time beating in a peculiar manner with a flat-faced hammer, then clamped in pair of jaws, and the joints drawn over by repeated taps of hammer, or in some shops by a heavy roller set in a machine called a backing machine, which clamps the back under treadle movement. Many extra forwarders round the book before trimming, then knock the round out. After cutting, the book will spring back to its former round, leaving the front concave. In the most particular class of work, the boards are laced to the book before it is cut. The ends of the twine to which the signatures are sewed are securely laced to the boards forming the cover, and the ends glued down on the inside of the cover. As the name implies, the material used for covers formerly was wood, but is now a thick pasteboard rolled very hard. The book is now ready for gilding, marbling, or otherwise coloring the edges. For *marbling* prepared colors are thrown into a shallow trough containing a preparation of gum tragacanth and other substances boiled in water, on which the colors float and spread, and

are by skillful manipulation made to assume the desired appearance. The edges of the book are dipped into the liquid, and the colors adhere. After the edges are thoroughly dry, they are burnished.

Gilding is done by laying thin sheets of gold-leaf on the edges of the book, which have first been scraped very smooth and covered with a preparation of white of egg, and which when dry, are thoroughly burnished.

The *headbands*, which are next attached, are purely ornamental, and serve to give a finished look to the head and tail of the volume. They consist of pieces of parchment worked over with colored silk by a process that partly fastens them to the back. The back is then lined with strong paper glued on, the amount of stiffening varying with the size of the book and style of binding. Most books are now made with open or loop backs, a paper loop being pasted to the back of the book, and to this false bands are glued. The leather being cut a little larger than the book, is dampened, then covered with paste and drawn smoothly over and turned in, and the covers pasted down to the colored linings of the book.

Finishing.—In the process of finishing there is room for display of much artistic taste. The ornamentation and lettering of fine bindings all are done by hand, the workman employing a great many tools and ornaments, which he first heats and then presses on the gold-leaf, which has previously been laid on the leather over a coating of white of egg. Ornamentation without gold is called 'blind tooling,' and is produced by rubbing or stamping the hot tool on the dampened leather. Though there are no books bound now that have such a wealth of ornamentation and so many days of careful labor given to the finishing as was common in Grolier's time, there are many rich and tasteful bindings produced and many novel effects by the use of inlaid colored leathers, incised leather, etc.

Edition Binding.—The processes in edition binding are essentially the same as in extra work. The difference consists in the use of machinery in place of hand work. Folding machines are of many varieties and great complexity. The original machine was a single sixteen folding machine. It was soon found possible to build double 16-folding machines doing nearly 20,000 sheets daily, and at present in some of the larger establishments special machines have been built which will take a sheet nearly 40x60 inches in size, and will turn out 40,000 signatures of 16 pages each, equivalent to the work of 16 girls folding by hand. When the books are found complete they are put through a powerful machine called a smashing machine which compresses the book and makes it solid, then are ready for the sewing machine. There are two principal varieties of sewing machines for book work: one stitches the signature through the center to a piece of crash with a wire staple, and the other sews through the signature with thread. The latter is now much more largely used.

In this machine each signature in turn is laid over the arms, is carried to a position under a row of curved needles, punches concealed within the arms first make an incision through which the curved needle carries a thread meeting a looper which fastens each stitch. The first and last sheet is pasted before they are placed over the arms, and when finished the book is cut apart from the following book, and the thread is held by the pasting of signature, from unraveling.

Following the sewing, books are re-smashed, the linings and cloth joint pasted in and books are ready for trimming. If it is to be marbled or gilt, the back is tipped with glue to keep the signatures from getting out of square or becoming irregular.

Trimming.—To remove the rough and uneven edges of the signatures, the book should be cut or trimmed. This may be accomplished in the straight cutter, a machine using one knife which, making a clean, smooth cut, descends while book is clamped, in some machines with a hand clamp, in others, automatically. This machine, while very satisfactory in its results, has given way for the trimming of editions of books to automatic trimmers of various makes, which, unlike the process of trimming in the straight cutter, trims the edges of the top, front and bottom of book without removing from machine.

After trimming and gilding, marbling or coloring, it is glued over back with thin coating of glue well rubbed in between the signatures to prevent the breaking between signatures, which, while not taking from the strength of binding, looks as if poorly bound; just before glue is dried too thoroughly, book is fed against the gauges of the rounding and backing machine, the front rolls of machine drawing or rolling the round under pressure, then carried to back part of machine where a backing plate rotates against the back and forms the joints. This machine will do the work of six to eight men.

After the process of rounding and backing, headbands are prepared by forming muslin over a cord or twine; the backs of books are thoroughly glued, headbands affixed at top and bottom of back, crash lining cut to extend about one inch or more over the joints, is rubbed on with a bone folder, heavy manila paper is then glued against the book and well rubbed in, after which books, when thoroughly dried, are ready to put in the covers.

Case Making.—In edition work the covers, called *cases*, are prepared and finished separate from the volume that they are to cover. A piece of cloth, cut somewhat larger than necessary to cover the entire book, is covered with glue on the inside. Pieces of millboard, previously cut to proper size by an ingenious machine having rotary knives, are laid on, and the cloth turned over, the proper distance between the two boards being maintained by a steel gauge. The lettering or design that is to be stamped on the cover is cut in brass or steel, and after the portion of the cover that is to show a gold lettering or ornament

has been covered with gold-leaf the stamp, which is fastened to the head of the embossing press, is heated by steam or gas, and pressed on the gold. All the gold not touched by the stamp readily brushes off, and is carefully saved and melted down; even the rubbers and cloths used in the operation are after a time burned to extract the gold they have absorbed.

Casing In.—The book and the cover, having been prepared separately, now come together. The outside of the book being covered with paste and placed in the cover, the completed volume is placed in a standing press between boards with brass edges which press into grooves between the cover and the ledge on the back, giving the grooved appearance common to most cloth books, though they are often pressed in plain boards, in which case the boards of the cover are brought close to the back so as to leave no groove in the cloth. The books are left in the press till thoroughly dry, when they are ready for delivery.

BOOK'-CLAMP: in *bookbinding*, a vise for holding a book while being worked. Adjustment is made by the nuts for the thickness of the book, and the pressure is given by the lever and eccentric. The term is applied also to a holder for school-books, etc., while carrying them. The cords pass through the upper bar; they are tightened by the rotation of the handle.

BOOK CLUB or Book Society: a private association printing books for a limited number of subscribers. The earliest of these clubs was the Roxburgh, but much more important work has been done by other English organizations, among them the Halsluyt Society and the Early English Text Society. In the United States the first association for the purpose of publishing was the Seventy-six Society founded in 1854, though before that time a number of literary societies had published the writings of their own members. Numerous similar societies have since been formed, the work of the majority being unimportant, the most noted of them is the Grolier Club of New York, founded in 1884. Its publications are of a literary and bibliographical character, and noted for artistic make-up and binding.

BOOK-EDGE ROLLER: implement in book-bindery, for putting a colored edge (known as wax-edge) on blank-books. The old process was: sprinkle hot wax on the edges, then brush them over with the desired color, scrape off the wax, and the edges would appear white wherever the drops of wax had adhered. By the new process the ink is taken from a marble slab by a perforated composition roller—patented by F. E. Grady, of Brooklyn, N. Y.—which is then passed over the edges of the books, producing exactly the same effect with much greater rapidity, and avoiding the many serious disadvantages of the old process. It is used in the U. S. govt. bindery at Washington, and by leading manufacturers.

BOO'KER, John: English astrologer: died 1667. He

was successively hatter and prof. of penmanship at Hadley. Later he commenced the study of astrology; and gained such a reputation that he was appointed to review the works published on astrology and mathematics. His most important work is entitled: *Mercurius Cœlicius, or A Caveat to All the People of England* (1664).

BOOKER, LUKE: 1762-1835: b. Nottingham: English author. He was rector of Tedstone, and published a number of theological and other works.

BOOK'-HOLDER: a reading-desk top, or equivalent device for holding an open book in reading position.

BOOKKEEPING is the recording of the transactions of a business so that the resources and liabilities may be readily exhibited. Transactions are recorded in the order of their occurrence in such books of original entry as may be imposed by the nature of each business or which conform to the requirements of the accounting system in use. If but a single book is used for this purpose, its form is usually that of the day-book, which contains a narrative of all the transactions as they occur. Formerly this was the general procedure, but it is found that business can be expedited by classifying the transactions in separate books, consequently the cash-book, purchase-book, and sales-book are now commonly used concurrently. Whatever may be the character and extent of the original records, the transactions are ultimately transferred in classified form to the ledger, which is the principal book of accounts. There are two systems of bookkeeping in use, namely, single and double entry. In bookkeeping by single entry only accounts with persons are kept in the ledger, and the profits and losses are ascertained solely by taking the difference between the net worth at the beginning and the net worth at the close of a stated period. The principal books used in single entry are the day-book, cash-book, and ledger. Being a simple though necessarily imperfect method, single entry is used chiefly by retail traders. Bookkeeping by double entry, as the term implies, is that mode in which every transaction is entered twice, first on the debtor side of one or more accounts, and next on the creditor side, thereby keeping the ledger perpetually in balance.

Bookkeeping, like most other sciences, has adopted a terminology of its own to avoid circumlocution. For example, the terms debtor and creditor, usually abbreviated Dr. and Cr., are used arbitrarily to designate the right-hand and left-hand side, respectively, of an account. An account is a collection of items, under an appropriate title, so arranged as to give a result by comparison. Journalizing is the mental process of deciding how every transaction is to be disposed of in the ledger; that is, what accounts are to be debited and credited in each case. Posting is the transferring of debit and credit items to their proper accounts in the ledger. A trial balance is a list of the open accounts in a ledger together with the

debit and credit footing of each account. A business statement is a summarized exhibit of those accounts which comprise all items of revenue, otherwise denominated a profit and loss account. A financial statement is a compilation of those accounts having to do with capital, in other words, a balance sheet. A balance sheet is a condensed statement of the resources and liabilities of a business. It is usually compiled from the trial balance and inventory schedules at the end of a fiscal period and it is frequently accompanied with a profit and loss statement which confirms the increase or diminution of finance as displayed in the balance sheet proper. The function of a balance sheet is, therefore, to present a scientific statement of the financial condition of a business at a specified date.

The advantages of the double entry system over the single entry system may be briefly summarized as follows: (1) the susceptibility of infinite modification in its minor features without disturbing the general results as shown in the balance sheet; (2) the constant equilibrium of debits and credits, the mathematical proof of which is afforded in the trial balance; (3) the separate classification of capital and revenue accounts; (4) the displaying of the channels through which profit and loss items have accrued; (5) the provision for the ascertainment of gross profits on the different departments of a business by means of the trading accounts; (6) the working economy resulting from the introduction of special columns in the books of original entry; (7) the ease with which a thorough audit can be conducted at any time, this circumstance serving as a check upon erroneous entries.

Each separate account contained in the ledger is built up on the theory of comparison. Thus the items of one side denote increase of financial ability, those of the other side its decrease. Hence to know the proper place in the ledger in which to assign each item in a transaction, is to know the laws, principles, and objects of each account in the ledger; and a false entry can only be proved by showing its want of conformity to some principle of the ledger.

The manner of recording transactions before they are arranged in the ledger, varies in almost every business, but this variation presents no confusion whatever when the different accounts embodied in the ledger are thoroughly understood. Double-entry accounting, in fact, admits of a great variety of modifications. The so-called voucher system, for instance, now extensively used in railway and manufacturing corporations, is an expedient for eliminating from the ledger individual accounts with creditors. At the same time, by the device of special columns in a voucher register, it facilitates the most minute subdivision of revenue expenditures and renders periodic comparison of such items possible to any degree desired. In most lines of business special columns may also be introduced in the cash-book, sales-book, and journal

for the purpose of minimizing the mechanical labor of posting, the aggregate of each column being transferred to the corresponding ledger accounts instead of the separate items. The principle of consolidated postings is applied in dividing the accounts of the general ledger among a series of subordinate ledgers, a common division being: general, sales, and purchase ledgers. Each of these ledgers can be made self-balancing, if desired, by means of special columns in the books of original entry, a controlling account being kept in the general ledger, representing the aggregate sums in each of the subordinate ledgers.

B. was brought to comparative perfection first by the merchants of Genoa and other cities in the n. of Italy; and developed by the merchants of the Netherlands, it was brought to England, in which country, as also in the British colonial possessions and the United States, it is now carried on in the best manner by professional accountants and skilled clerks. Broadly stated, it is the province of the accountant to devise the accounting system and to specify the nature and character of the records that shall be kept; it is the duty of the bookkeeper to perform the routine work of recording the transactions of the business in accordance with the plan outlined by the accountant; it is the function of the auditor to examine critically the completed records of the bookkeeper, to compare the entries with the documents, to ascertain if the plans of the accountant have been strictly followed and, finally, to prepare the profit and loss account and certify to the correctness of the balance sheet. It is incumbent upon the auditor to exercise every faculty and means in his power to determine (1) that the liabilities are all stated; (2) that the resources are not overstated; (3) that the profit and loss contains all expenses chargeable to the period under review; (4) that the profits earned are all included; (5) that proper charges against revenue have not been capitalized; and (6) that intentional errors, irregularities, and fraudulent entries have not been permitted. The professional duties of the competent public accountant and auditor, therefore, cover a wide range of technical knowledge and commercial experience.

BOOK'-MAKING: act or practice of entering in a book wagers of odds against the occurrence of a specific doubtful event—e.g., that a specified horse will win a specified race (see GAMBLE: HORSE-RACING). The 'bookmaker,' called also the 'layer,' offers odds—3 to 1, or $1,000 to $300, $200, $100, $50, etc.—against each horse in the race. In any event, he loses $1,000 or whatever the sum may be which he wagers; but as there can be only 1 winning horse, he calculates to win from the 'backers' of the others more than enough to reimburse him. See BETTING: POOL.

BOOK-STALLS: see BOOK-TRADE.

BOOK'-TRADE: business of dealing in books, in which

are engaged two classes of persons—Publishers, who prepare and dispose of books wholesale; and Book-sellers, to whom the retailing of books more properly belongs. Although frequently distinct, the two professions may conveniently be treated together. While publishing apart from book-selling, is of modern date, the selling of books is as old as the origin of literature. About the middle of the 6th century B.C., is found in ancient Athens an approximation to a systematized book-trade as it has been understood in modern times. Pisistratus, with funds from the municipal treasury, paid scholars for preparing a standard text of Homer and Hesiod for copyists' use. The books then made were very costly. The first book-sellers prepared by their personal labor the scrolls they sold; then capitalists came to employ and organize staffs of copyists. About 250 B.C. Alexandria became one of the great book-centers of the world. In this it was favored by having at its disposal the scholars of the university and the facilities for distribution which the commerce of Alexandria afforded. Skilled scribes were also carefully trained there. The book-trade of Rome commenced about the 2d century B.C. Slaves who could write Greek were rated highly. The great publisher of Cicero's time, Atticus, is well known. His editions were famed for their accuracy under the name Ἀτικιανά. In addition to his central publishing house he had distributed in various portions of Rome and in provincial centres, tabernarii, or retail dealers. Horace's publishers were the Sosii in the Vicus Tuscus. Argiletum, Martial says, was the street of the book-sellers, as it was, likewise, of the tailoring shops of fashion. By the close of the 1st century A.D., the Roman book-trade was extensive and well organized. Papyrus was imported in great quantities from Egypt, and large staffs of copyists were kept busy preparing editions of various works, the average edition for the general public running from 300 to 1,000 copies. Very considerable shipments were made to the provinces.

During the Middle Ages book-making and selling belonged to the monasteries. The different monasteries transcribed the particular manuscripts treasured in their libraries, and their editions came to have a peculiar value, depending upon the character of the original text and the accuracy of the copy. At the beginning of the new learning, the manufacture and sale of books passed to the universities, within which the manifolding of MSS. was done by an organized guild. Outside the universities, however, there was a considerable trade in MSS., beginning with the end of the 14th century. The invention of printing naturally revolutionized the book-trade.

The first printers acted also as book-sellers, and, being mostly learned men, they were generally the editors, and, in some instances, the authors of the works which they produced. See PRINTING. Some instances of division of the two branches, printing and book-selling, occurred

in the 15th c. In consequence of the Reformation the seats of learning were gradually removed from the southern to the northern states of Germany, and the book-sellers followed their customers.

Migration from place to place, and also resorting to the great continental fairs for customers, the early book-sellers became known as *stationarii*, or stationers, from the practice of stationing themselves at stalls or booths in the streets, as is still customary with dealers in old books. The term stationer, long held to be synonymous with book-seller, is in modern times commonly applied to dealers in paper and other writing materials. Whether settled or migratory, the early publishers and sellers of books were subject to a number of restrictions, as is still the case in France and Russia.

In England the book-trade was trammelled by royal patents and proclamations, decrees and ordinances of the Star Chamber, licenses of universities, and charters granting monopolies in the sale of particular classes of works.

In the infancy of the trade authors frequently resorted to the plan of getting friends and patrons to subscribe for copies of their forthcoming works; the publisher in such cases acting only as commission-agent.

The plan of issuing neat, cheap editions of popular works was originated 1760-70 by Alexander Donaldson, an Edinburgh bookseller; and was followed by several publishers in London, one of whom, C. Cooke of Paternoster Row (1790-1800), issued an extensive series of cheap reprints, of a pocket-size, called *Cooke's Editions*. About 1817–18 some enterprising book-sellers began to break through certain old usages of the trade, by issuing reprints of standard works in good typography, at considerably reduced prices. At the same time numerous cheap periodicals began to appear: see PERIODICALS: NEWSPAPER. In 1827, Archibald Constable began the cheap series of works in original literature, *Constable's Miscellany*. To the period 1827–32 may be referred the origin of the 'cheap press.' Constable's attempt to cheapen literature was happily coincident with a general awakening in the public mind, and was very successful; imitations followed; a variety of serial works, in small volumes, for popular use, made their appearance. A similar popularizing of the price of periodicals was the next step. A multitude of cheap publications of various kinds followed, facilitated by two great inventions—the paper-making machine and the cylinder printing-machine—within the preceding 20 years. The continued issue of cheap reprints of popular works out of copyright has changed the aspect of the trade; and though works at old prices are as numerous as ever, cheap books of an improving tendency are now within general reach: new and copyright works also issued in cheap form, in boards, with colored paper covers. Now, as formerly, the book-trade of Britain is centered in London, though carried on to a considerable extent in Edinburgh, and in a less degree in Oxford, Cambridge, Dublin, Glasgow, and elsewhere.

BOOK-TRADE.

The book-trade in the New World had its origin in a more remote period than is generally supposed. It began within 100 years of the invention of printing, and from the date of the first American book, 1535, to the year 1799, over 7,000 different books had been published, nine-tenths of them however being pamphlets. The 19th century saw almost the full development of book publishing, the establishment of colleges and schools and the founding of many libraries, creating an ever-increasing demand for the best in literature. The first book printed on the American continent is said to have been *La Escalera Spiritual de San Juan Climaco,* published in Mexico in 1535. It was a translation from the Latin into Castilian. Other books were printed on the first press set up in Mexico and six or seven books are known to have been published in Peru before 1600. In the United States the earliest publication was a pamphlet called *The Freeman's Oath,* printed in Boston in 1639. This was followed in the year 1640 by the *Bay Psalm Book,* printed by Stephen Daye at Cambridge, Mass. The first original American book published in this country was Mrs. Anne Bradstreet's *Poems,* and this volume, issued in Cambridge, Mass., in 1640, was republished in London in 1650. Cambridge remained the only publishing town for a long time, and for 21 consecutive years issued about one volume a year. In 1653 Samuel Green published John Eliot's famous *Catechism* in the Indian language, followed in 1659 by the Psalms in Indian, in 1661 by the Indian New Testament, and in 1663 by the whole Bible in the Indian tongue. This was the first Bible printed in America. In New York city the original book publisher was William Bradford, who became official printer in 1693. In 1694 he issued the *Laws of the Colony,* the first bound book published in New York. In 1738, Christopher Sauer established a publishing house at Germantown, Pa., and issued the first German Bible printed in America in 1743. The firm of Little, Brown & Company was established in 1784 in Boston while in the following year in Philadelphia, Lea Brothers & Company and Henry Baird & Company began business. It was also in 1785 that S. E. Bridgeman & Company began publishing books at Northampton, Mass. The existing house of J. B. Lippincott & Company was established in Philadelphia in 1798. The firm of Harper & Brother began business in New York in 1817. From this date the publishing business had a rapid growth.

As an adjunct to publishing, the selling of books originated in Boston as early as 1652, when Hezekiah Usher opened the first shop. Many colonial book-sellers printed and published their wares. Benjamin Franklin (q.v.) was among the early book printers. The first convention of booksellers for the regulation of trade seems to have been held in Boston, 1724; it was for the special purpose of increasing the prices of certain works. Toward the close of the century bookselling began to take rank among

the most considerable commercial pursuits, though it then only foreshadowed its present comparative importance. Works of standard character, involving large expenditures, were undertaken by publishers, who, in such cases, usually subscribed together as a guarantee for the printer's outlay. The trade was conducted upon established principles, and innovators were held in poor esteem. All these usages were, however, disturbed by competition, and after the publication of the Waverly novels, of which rival editions were issued, the individual members of the trade acted more independently of each other. The American Company of booksellers was founded in 1801. The universal diffusion of education in America increased the circulation of books and reduced their price.

In 1903 there were 1,700 book publishers in the United States. While Boston and Philadelphia remain true to their earlier reputations as leading book centres, New York has become the largest book mart and the leading factor in the manufacture of books. Chicago too has assumed an important place in the book trade, while some hundreds of books are published annually in Cincinnati, San Francisco, Cleveland, and other smaller cities. The majority of American books are published by 100 firms in New York, Boston, Chicago, and Philadelphia. An important factor in book-making during the 19th century was the phenomenal production of school and college text-books, and the steady increase in that production. Many encyclopedias, dictionaries, complete works of standard authors in definitive editions, etc., are sold by subscription; the initial expense of such books being enormous before a single copy of the book is made, the sales must be enormous also.

In the United States, as in Britain, various arrangements are made between authors and publishers; though it is usual in this country for the publisher to allow the author a royalty or copyright payment of 10 per cent. on the retail price of all sales. Often, however, the publisher buys the copyright for a gross sum paid to the author. Various methods which may be adopted are the following: (1) the author sells his work in manuscript to the publisher for a specified sum, giving him an assignment of the copyright, and leaving him to bring out the work according to his own fancy; or (2), the author retains the copyright, pays all expenses, undertakes all risks, and gets a publisher to bring out his work; or (3), the author, retaining the copyright, incurs no risk, and only allows the publisher to print and issue an edition of a certain number of copies for a sum agreed on; or (4), the author and publisher issue the work at their joint risk, and on such other terms as are mutually agreeable; or (5), the publisher agrees to issue at his own risk and expense the works of a popular author—the clear profits to be divided into 3 equal shares, 1 for author, 2 for publisher—or author receiving half the profits (perhaps 20 per cent. on each

volume sold); or (6), the familiar royalty system, by which the publisher takes whole or partial risk, and pays the author a certain sum per copy after the disposal of a certain number of copies.

In publishing new books in Britain or America, these items of outlay are to be taken into account: Copyright (q.v.), paper, setting up the types, author's corrections, electrotyping, press-work or printing, embellishments, and binding. Later come the great advertising and selling expenses. The publisher has not only to manufacture the book, but also to make it known to the public, while the retail book seller has little else to do than to hand across the counter the book for which a demand has been stimulated by the costly efforts of the publisher. The grand difficulty with the publisher is to excite general attention to his wares. Hence the stupendous advertising system in newspapers and other channels of intelligence. The monthly and quarterly periodicals being important advertising channels, it is of consequence for publishers to possess one of these, both for the revenue that it may produce and for keeping their own books before the public.

BOOLAK: see BOULAC.

BOOLE, *bôl*, GEORGE: 1815, Nov. 2—1864, Dec. 8; b. Lincoln: distinguished mathematician. He started a school at Lincoln, 1835; and, from 1849 till his death, he was prof. of mathematics in Queen's College, Cork. He was one of the foremost mathematical thinkers of his time. Among his publications are: one on *Analytical Transformations* (1839); on a *General Method in Analysis* (1844); *Mathematical Analysis of Logic* (1847); and on *Probabilities* (1834).

BOOLEY, n. *bô'lĭ* [Ir. *buachail*, a cowherd—from *bo*, a cow; *gille*, a boy]: an Irish nomad; one of a horde, Tartar-like, continually moving from place to place, and subsisting on the milk of the cattle which they drive.

BOOM, n. *bôm* [Dut. *boom*, a tree or pole: Ger. *baum*, a beam]: a long pole or spar used in a ship to stretch out any particular sail at the bottom; chain, rope, spars, or other obstacle across a river or harbor to hold logs, or prevent the approach of hostile ships. BOOMS, n. pl. *bômz*, in *nav.*, space in a ship's waist used for boats and spare spars.—BOOM, in a *ship*: general name for the long poles which jut out from certain supports or uprights, to stretch or extend the bottoms of sails. Some taper regularly from the middle toward both ends; while others have the thickest part at about one-third the length from one end. According to their particular modes and places of application, they receive the names of *jib-B.*, *flying jib-B.*, *studding-sail B.*, *lower studding-sail B.*, *main B.*, *square-sail B.*, *driver-B.*, *spanker-B.*, *ring-tail B.*, *main-topmast B.*, *fore-topmast B.*, *fire-B.*, etc.

Beside the booms on board ship, the same name is given also to a floating though fixed obstruction, such as a

line of heavy logs strongly moored, to confine timber from floating away; or to a strong iron chain, floated by logs, employed in barring the passage of the mouth of a harbor or river, or to cut off the retreat of an enemy if he has actually entered—the B. being protected by batteries. A modern war-steamer would cut through a chain-B. unless of very thick and strong iron. The Russians effectually boomed the harbor of Sebastopol, 1854, Sep., preventing the entrance of English and French ships; this was done partly by sinking some of their own ships, and partly by the laying of booms.

BOOM, n. *bôm* [Dut. *bommen*, to sound like an empty barrel when beaten upon; Gael. *beum*, a heavy blow]: to sound loud and heavy, as a gun; to rush quickly, as a great ship through the water; to roll and roar, as a river rising and swelling in rapid flood. Also, in the United States (since 1878), to become suddenly active, prosperous, important, or prominent—as a business, or a town, or a candidacy for office; to stimulate into sudden activity; to push into prominence by use of vigorous, and often of concerted, means: N. a hollow roar, as of a cannon-ball rushing through the air. Also, in the United States, an increasing roar, as of a swollen river; sudden increase (usually temporary) in value or in prominence; spontaneous or stimulated advance in price—as of lands, etc.—or growth in popular favor, as of a candidate. BOOMING, imp.: ADJ. designating a dull, loud and hollow sound: N. a dull, hollow, roaring sound. BOOMED, pp. *bômd*.

BOOMERANG, n. *bôm'ĕr-ăng:* a curved wooden missile, for war, sport, or the chase, thrown by the natives of Australia with wonderful precision, so as to return of itself toward the thrower. It is of hard wood, of bent form; the shape is parabolic or curved somewhat like a scimitar. It is about 2½ in. broad, ⅓ in. thick, and 24-30 in. long, the extremities being rounded. One side is flat, the other rounded; and it is brought to a bluntish edge. The method of using this remarkable weapon consists in throwing it in a particular manner. It is taken by one end, with the bulged side downward, and the convex edge forward, and thrown directly onward, as if to hit some one thirty yards in advance. Instead of going directly forward, as might be expected, and there falling to the ground, it slowly ascends in the air, whirling round and round, and describing a curved line of progress till it reaches a considerable height, when it begins to retrograde, and finally it sweeps over the head of the projector, and falls behind him. This surprising motion is produced by the bulged side of the missile. The air impinging thereon lifts the instrument in the air, exactly as by hitting the oblique bars in a windmill it forces it to go round. The ingenuity of this ancient weapon, which is worthy of the highest scientific calculation, is very extraordinary as coming from almost the lowest race of mankind.

BOON, n. *bôn* [AS. *ben*, petition, prayer: Icel. *beidne*, and *bôn*, desire, a petition]: request; answer to a prayer or petition; a favor granted; a free gift.

BOON, n. *bôn:* the woody heart of dried flax.

BOON, a. *bôn* [L. *bonus;* F. *bon*, good]: gay; merry, as *boon companion.*

BOONE, *bôn:* city of Iowa, cap. of Boone co., on the Chicago and Northwestern r.r., and terminus of the St. Louis, Des Moines and Northern r.r. B. is in a rich farming region; has large coal trade; in the vicinity is abundance of superior clay for brick and tile making and pottery. Chief manufacturing establishments are brickyards, tileworks and potteries, glove, moccasin, harness, and carriage factories, iron foundry, meat-packing house, and the construction and repair shops of the Chicago & Northwestern R. R. Chief buildings, a court-house, city hall, free library, and hospital. (1910) 10,347.

BOONE, DANIEL: pioneer: 1735, Feb. 11—1820, Sep. 26; b. near Bristol, Bucks co., Penn. His grandfather emigrated from England 1717; and his father was born in Bucks co., but resided for a time after Daniel's birth at the headwaters of the Schuylkill, and later on the South Yadkin, in N. C. Young Daniel had very limited education, even for the place and period, learning little more than to read, write, and cipher. He was a hunter by natural instinct, and passed most of his life in hunting, trapping, and fighting Indians. He married, about 1755, Rebecca Bryan, daughter of a neighbor on the Yadkin, and remained some years in that vicinity. In 1769, he became interested in accounts which he received from John Finley, who was the first to enter the wilderness of Kentucky, and who brought back an exciting description of the natural resources of the new country. B., restless after a long period of domesticity, determined to explore the new region. He accordingly organized a company, including John Finley, John Stuart, Joseph Holden, James Monay, and William Cool, and left his home 1769, May 1, on his first exploring expedition. The party met numerous interruptions from Indians, and encountered obstacles of all sorts, some members of the company losing their lives. B. and his brother, who had joined him, returned to the Yadkin 1771, Mar., and notwithstanding the hardships they had passed through, organized a number of families determined to settle in the new country. This expedition was unsuccessful, and those of the emigrants who survived the frequent conflicts with the Indians established themselves on the Clinch river, where was now located the home of the Boone family. B. was employed by Lord Dunmore 1774 as a scout and guide; and, later, had command of a considerable body of Indian fighters. His most important act was the arranging of a treaty with the Cherokee Indians 1775, Mar. 17, by which a large tract of land was sold by a delegation of Cherokee chiefs to a number of wealthy gentlemen of the Carolinas, known

as the 'Proprietors of Transylvania,' that being the name of the territory acquired, on which it was designed to establish a republic—one of the first expressions of the rising resentment against the mother country. The land parted with by the Cherokees is thus described: 'All that tract of land beginning at the mouth, or junction of the Kentucky and Louisa river with the Ohio; thence to the source of the former; thence south, into Tennessee, until a westward line shall cross the Cumberland Mountains so as to strike the ridge which divides the waters of the Tennessee from those of the Cumberland; and with that ridge to the Ohio river; and with that river to the mouth of the Kentucky or Louisa river again.' This purchase was afterward annulled by the state of Va.: the land amounted to about half the present state of Ky. In 1775, B. made a settlement and built a fort on the banks of the Kentucky river, named by him and still known as Boonesborough. In 1780, B. brought his family to Ky., and had many narrow escapes. His brother, 'Squire' B., and one of his sons were killed in fights with the Indians. B. lost his land when Ky. was admitted into the Union as a state 1791, Feb. 4; and he resided thereafter in Mo., where the Spaniards, who then owned that country, had given him a tract of about 8,000 acres of land. He lost this land, also, when the Louisiana purchase became the property of the United States, but congress finally granted him 850 acres. He passed the last years of his life on this property near Charrette, Mo., occupying himself with hunting and trapping. His wife died 1813.

BOONE, William Jones, M.D., D.D.: bishop of the Prot. Episc. Church: 1811, July 1—1864, July 17; b. Walterborough, S. C. After graduating in the Coll. of South Carolina 1829, he studied law and was admitted to practice, but turned to the Episc. ministry as a profession. He entered the Virginia Theol. Sem.; and, purposing to be a missionary in heathen lands, qualified himself to be a physician, graduating M.D. in the South Carolina Med. Coll. He was ordained priest 1836, and sailed for China 1837. He was elected missionary bp. for China 1844, and the same year was consecrated in Philadelphia. He made two later visits to America, 1852 and 57, on the latter occasion remaining two years in this country. He died in Shanghai. Dr. B. translated the Prayer-book into Chinese: at the time of his death he was engaged in revising the Chinese translation of the Bible.—His son, William Jones B., D.D. (b. Shanghai 1847), missionary bp. of Shanghai, graduated at Princeton, 1865, studied theol., was ordained priest at Hankow 1870, and consecrated bishop at Shanghai 1884.

BOONTON, *bôn'ton:* town of New Jersey, 30 m. n.w. of New York on the Delaware, Lackawanna & Western railroad, and on the Rockaway river and Morris canal, which supply motive power for its industrial works. B.

is beautifully situated among hills near the great lake reservoir of the Jersey City waterworks, is a residential and summer resort, and is noted for its extensive iron works in all branches of manufacture, and for paint, paper, silk, and rubber factories. Old Boontown, 1 m. distant where the first nail mill in the country was built, 1770, was destroyed by a break in the river dam, early in the 19th c. Pop. 5,000.

BOONVILLE, *bôn′vĭl:* town of Indiana, seat of Warrick co., on the Southern railroad, 18 m. n.e. of Evansville. It is the trade centre of a lumbering, farming, and coal-mining section, and profitable clay and other mineral deposits are worked. Pop. (1890) 1,881; (1900) 2,849; (1910 est.) 3,000.

BOONVILLE, or BOONEVILLE: city of Missouri, seat of Cooper co., 45 m. n.w. of Jefferson City, and 100 m. e. of Kansas City, on the s. bank of the Missouri river, here spanned by a fine bridge of the Missouri, Kansas & Texas railroad, and connecting with the Boonville branch of the Missouri Pacific railroad. B. is built on a bluff about 100 ft. above high-water mark, is a summer resort, has manufactures of iron, pottery, flour, shoes, etc., and carries on a busy river trade. Coal is mined in the neighborhood. The State Reform school for boys, Cooper Institute for women, and a fine park are local features. B. was the scene of the Union victory by Gen. Lyon over the Confederate forces under Marmaduke, June 17, 1861. Pop. (1890) 4,141; (1900) 4,377; (1910) 4,252.

BOOR, n. *bôr* [AS. *geburb*, a peasant: Dut. *boer;* Ger. *bauer;* Gael. *búr*, a boor: Dut. *bouwen*, to till]: a countryman or field-laborer; a rustic; a clown; an ill-mannered, coarse, and ignorant man. Boor′ish, a. rustic; awkward and rude in manners. Boor′ishly, ad. *-lĭ*, Boorishness, n. coarseness of manners.

BOORGHAS′: see Burgas.

BOORHA′NPOOR: see Burhaunpur.

BOORLOS, or Bourlos, *bôr′los:* the *Buticus lacus* of the ancients; a lagoon in the n. part of the Delta of the Nile, in Egypt, about 5 m. e. of Rosetta. It is about 50 m. in length by 25 in breadth; and generally quite shallow, being marshy in different parts. A narrow strip of land separates it from the Mediterranean, with which it communicates at the e. by a narrow strait. It is connected with the Nile by several canals. Fish are abundant.

BOORO, *bô′rō:* island of the Malay archipelago, about 60 m. w.n.w. of Amboyana, 2,000 sq.m. Though mountainous, it is very fertile. At the e. end of the island the Dutch have a station. Pop. estimated 20,000—100,000.

BOOROJIRD, or Boroogird, *bô-rô-jĕrd′:* town in the province of Irak-Ajemi, Persia, in a fertile valley about 190 m. n.w. of Ispahan; lat. 33° 43′ n., long. 48° 45′ e. It has a castle and several mosques. Pop., chiefly agricultural, abt. 12,000.

BOO'SA: see BOUSSA.

BOOSE, n. *bôz* [AS. *bosig;* Icel. *bás,* a stall]: in *old* and *prov. Eng.,* a stall for cattle. BOOSY, n. *bô'zĭ,* the trough out of which cattle feed. BOOSY PASTURE, the pasture adjoining the cattle-stall.

BOOSE, BOUZE, or BOOZE, v. *bôz* [see BOUSE]: to drink much with others. BOOSY, a. *bô'zĭ,* fuddled; merry. BOOS'ING, imp. BOOSED, pp. *bôzd.*

BOOSTER: an auxiliary dynamo electric machine for adding an electric pressure or voltage to a circuit. See BATTERY, STORAGE, and ELECTRICITY, PRINCIPLES OF.

BOOT, v. *bôt* [AS. *bót;* Goth. *bota,* advantage, good: AS. *botan,* to pay the price of: Icel. *bót,* advantage: Dut. *boete,* fine, forfeit]: to give advantage to; to profit; to do good; to enrich: N. profit; gain; advantage. TO BOOT, ad. into the bargain. BOOT'LESS, a. without advantage; not contributing to further the end in view. BOOT'LESSLY, ad. *-lĭ.* BOOT'LESSNESS, n. the state of being fruitless. BOOTLESS ERRAND, an errand fruitless, or by which nothing was gained.

BOOT, n. *bôt* [F. *botte,* a boot: Dut. *bote*: Gael. *bot:* Sp. *bota;* It. *botta,* a hollow skin]: a covering of skin or leather for the feet, ankles, and part of the leg; a box for luggage in the fore part of a coach; an instrument of torture for compressing the leg: V. to put on boots; to make ready for riding. BOOT'ING, imp. BOOT'ED, pp. BOOT-CRIMP, a tool or a machine for giving the shape to the pieces of leather designed for boot uppers. BOOT-HOSE, stockings to serve for boots; splatterdashes. BOOT'JACK, n. an article for taking off boots. BOOT-TREE, a boot-last; a block on which boots are stretched. BOOTEE, n. *bô-tē',* a short or half boot. BOOTS, n. plu. *bôts,* an under-servant in a hotel or inn, whose duty it is to clean the boots of travellers; in *familiar slang,* a term for the youngest officer at a regimental mess. BOOT-TOPPING, scraping off the adhering matter from a ship's bottom, and then daubing it with tallow. BOOT AND SADDLE, the trumpet-call which precedes the march of cavalry.

BOOT, or BOOTS, or BOOT'IKIN: instrument of judicial torture, formerly used in Scotland to force confessions from persons accused of crimes, or answers from unwilling or suspected witnesses. Bp. Burnet in the *History of his Own Time,* and Sir Walter Scott in his *Old Mortality,* speak of the B. as made of iron; but the Rev. Thomas Morer in his *Short Account of Scotland,* written from personal observation of the country when the B. was still in use, describes it as 'made of four pieces of narrow boards nailed together, of a competent length for the leg.' One or both legs of the person to be tortured having been placed in this case, wedges were inserted between the limb and the sides of the case, and these wedges were driven down by the executioner with a mall or hammer, questions being at intervals put to the sufferer, until either he gave

the desired information, or fainted away, or showed such endurance as satisfied the judges that no answer could be extorted from him. The wedges were commonly placed against the calf of the leg, but Bp. Burnet says he had heard that they were sometimes placed against the shin-bone. In one case—that of a lad in Orkney, 1596—it is recorded that they were struck home as many as 57 times. It is remarkable in how many cases we are told that the torture, agonizing as it was, failed in its purpose, even where the sufferer 'shrieked for pain in terrible manner, so as to have moved a heart of stone.' When the boots were first used in Scotland is not known. A young gentlewoman of Aberdeenshire was tortured by the B. in 1630. Soon afterward, it is said to have fallen into desuetude for about 30 years. It was revived after the insurrection of the westland Covenanters 1666, and continued to be used through the reigns of King Charles II., and King James II., and during the first years of King William III. The claim of Right brought forward by the Scottish Convention 1689, denounced 'the use of torture, without evidence, and in ordinary crimes, as contrary to law.' Notwithstanding this declaration, the B. was used at least once again in 1690. But it was not until Scotland had ceased to be an independent kingdom, that the British parliament enacted that in future 'no person accused of any crime in Scotland shall be subject or liable to any torture.'

BOO'TAN: see BHOTAN.

BOÖTES, n. *bŏ-ō'tēz* [Gr. *boötes*, a plowman]: the constellation following the Great Bear; in ancient mythology, the son of Ceres and Iasion; who, being plundered of all his possessions by his brother Pluto, invented the plow, to which he yoked two oxen, and cultivated the soil to procure subsistence for himself. As a reward for this discovery, he was translated to heaven by his mother with the plow and yoke of oxen, under the name of B., i.e., the Ox-driver, still borne by one of the constellations. According to others, B. was son of Lycaon and Callisto, whom his father slew, and set before Jupiter for a repast, to try his omniscience. Jupiter restored him to life, and placed him among the stars.

BOOTH, n. *bôth* [Gael. *both* or *bothan*, a cottage or hut: Icel. *buth*, a hut: W. *bwth*, a hut, a booth: Dut. *boed*]: a house or shed built of light materials, as wood or boughs of trees; a stall at a fair. BOOTHY or BOTHY, n. *bŏth'ĭ*, in many parts of Scotland, a hut built of whatever materials are nearest at hand—wood, turf, or stone—for the accommodation of unmarried farm-servants; a cottage or house for the lodging of unmarried farm-servants.

Throughout Europe, in early times, trade was carried on chiefly by fairs, as it still is in some parts of it, and in many parts of Asia. The tents, huts, or other temporary or movable structures in which the traders exposed their goods for sale, were called *booths*. Though the correspond-

ing German *bude* is generally referred to *bauen*, to build, the English *booth* is traced by some to the Gaelic *both* or *bothag*, a bothy or hut; by others to the Greek *apotheke*, through the Latin *apotheca*, the Italian *boteca*, and the French *boutique*—all signifying an office, shop, store-house, or tavern. From this, its primary sense, B. gradually came to mean a fixed shop or warehouse. As towns sprang up, the yearly fair was more or less supplanted by the weekly market. The slight B. set up in the same spot every week, had a tendency to become substantial and permanent; and the records of the 12th and following centuries are full of unavailing complaints against the encroachments in this way upon the market places and streets. So in Edinburgh the range called at first 'the Boothraw,' and afterward 'the Luckenbooths,' arose in the very centre of the High Street. So, likewise, in Edinburgh and elsewhere, the trader who for years had spread his stall under the shelter of the same buttress of the church or town-hall, began to rest a fixed wooden B. against it, gradually transforming the timber beams into lath and plaster, or even into brick or stone, until at length the basement of the stately cathedral, or *hôtel de ville*, was incrusted all over with unseemly little booths (or *krames*, as they were called in Scotland). For booths used in England for theatrical representations, see THEATERS, LAWS AS TO.

BOOTH, AGNES (Mrs. JOHN B. SHOEFFEL), American actress: b. Sydney, Australia, 1846, Oct. 4. She made her first American appearance in New York in 1865, becoming later Edwin Forrest's leading lady. She has assumed numerous famous roles with success. She has been three times married.

BOOTH, BALLINGTON, general of the Volunteers of America: b. Brighouse, England, 1859, July 28. He is a son of William Booth (q.v.), founder of the Salvation Army, with which body he was officially connected until 1896, when he seceded and founded the Volunteers, a religious body under the form of a military organization, organized in the interest of the unchurched masses.

BOOTH, BARTON, English actor: b. 1681; d. 1733, May. He was educated under Dr. Busby, at Westminster School. An early attachment for the drama was fostered by the applause he met with while performing a part in one of Terence's plays at the annual exhibition in that seminary. He ran away from school at the age of 17, and joined Ashbury's company of strolling players, with whom he went to Dublin. After performing three years in the Irish capital with great applause, he returned in 1701 to London and, engaging with Betterton, met with similar success. On the death of that manager he joined the Drury Lane Company, and on the production of *Cato* in 1712, raised his reputation as a tragedian to the highest pitch by his performance of the principal character. It was on this occasion that Lord Bolingbroke presented him from the stage box with 50 guineas—an

example which was immediately followed by that nobleman's political opponents. Declamation, rather than passion, appears to have been his forte, though Cibber speaks of his Othello as his finest character. He became a patentee and manager of the theatre in 1713, in conjunction with Wilks, Cibber, and Doggett. He was buried in Westminster Abbey, where there is a monument to his memory. He was the author of Dido and Æneas, a mask, various songs, etc., and the translator of several odes of Horace.

BOOTH, *bôth*, Edwin Thomas: actor: 1833, Nov. 13—1893, June 7; b. Bel Air, Md., son of Junius Brutus B. He had a limited private school education; was his father's traveling companion at an early age; and under his father's instruction and encouragement made his first public appearance on the stage as Tressel in *Richard III.* at the Boston Museum, 1849, Sep. 10. During the season 1849–50 he appeared as Cassio in *Othello* and Wilford in *The Iron Chest* in Providence, Philadelphia, and elsewhere; 1850, Sep., made his first appearance in New York; and 1851 assumed for the first time and without an hour's preparation, on his father's sudden illness, the principal part in *Richard III.* He played with his father and elder brother in San Francisco 1852; made a tour of Australia and the Sandwich Islands 1854–56; appeared in Boston as Sir Giles Overreach 1857; made his first star appearance in New York the same year; made his first professional trip to Europe 1860–62; and became manager of the Winter Garden Theater, New York, 1862. The assassination of Pres. Lincoln by his brother, John Wilkes B. (q.v.), was a crushing blow to him. He immediately issued a patriotic and tender address to the American people, deploring the crime, avowing his own loyalty to the Union, and announcing his permanent retirement from the stage; but was induced to reconsider his determination and reappear 1866, Jan. 3, as Hamlet at the Winter Garden Theater. 1869, Feb. 3, he opened the theater bearing his name in New York, and managed it till 1874, when he became bankrupt. In 1876 he made a tour of the United States; 1881, Jan., began an engagement in London, in which he alternated with Henry Irving (q.v.) in the characters of *Othello* and *Iago;* 1881, Oct. 3—1882, Apr. 29, played in leading American cities; 1882 made his third season in England and his first in Germany; 1884–87, starred in the United States; 1887–8, played alternating parts with Lawrence Barrett; and, 1888, presented to the Players' Club of New York a completely furnished house on Gramercy Park. —Edwin Booth died after a prolonged illness in his rooms at the Players' Club. His place in the history of the American stage is with difficulty to be described. Except perhaps Edwin Forest, he was the most cultured actor of his time, with singular refinement and spiritual charm. His acting was the expression of his delicate, sensitive, thoughtful nature, and he was equally admired on the stage and esteemed and loved as a man. Gifted with remarkable in-

tellectual power, and thoroughly skilled in his work as an artist, there were certain characters in which he might be compared unfavorably with other actors, but there were other characters in which he was supreme, e.g., Iago, Sir Giles Overreach, Hamlet, Richard III., and Petruccio in *The Fool's Revenge.*—See William Winter's Life, etc.

BOOTH, Henry Matthias, d.d.: Presbyterian clergyman: 1843, Oct. 3—1899, Mar. 18; b. New York. He received his early education in New York, and entered Williams Coll., graduating 1864. He graduated from Union Theol. Sem., New York, 1867; and immediately accepted a call to the Presb. Chh., Englewood, N. J., where he remained 24 years. The church under his pastorate had great prosperity. He spent part of 1891 in Europe, and in the winter of 1892 preached in the Brick Presb. Chh., New York. In the spring of 1893 he was elected pres. of the Presb. Theol. Sem., Auburn, N. Y., with which office is combined the professorship of practical theology. Dr. B. published *The Heavenly Vision* (1885); *Sunrise, Noonday, and Sunset of the Day of Grace* (1880); *The First Communion* (1894).

BOOTH, James Curtis: ll.d.: chemist: 1810, July 28—1888, Mar. 21; b. Philadelphia. He graduated at the Univ. of Pennsylvania, 1829, and studied at the Rensselaer Polytechnic Inst., Troy, N. Y. He was in Europe 1832–35 studying chemistry; and established in Philadelphia 1836 the first chem. laboratory in the United States for the study of applied chemistry. In 1836 he was made professor of chemistry, applied to the arts in the Franklin Institute; during 1837–8 he had charge of the geological survey of Delaware, and assisted in that of Pennsylvania; in 1849 he was appointed melter and refiner at the United States mint in Philadelphia, an office he held until his resignation 1888, Jan. 7. His studies of the nickel ores of Pennsylvania led, in 1856, to the adoption of nickel as one of the components of the alloys used in the coinage of the 1857 cent. Publications: *Annual Report of the Delaware Geological Survey* (1839); *Memoirs of the Geological Survey of Delaware* (1841); *Encyclopædia of Chemistry, Practical and Applied* (1850); *Recent Improvements in the Chemical Arts* (Wash. 1851); and he edited, with notes, a translation of Regnault's *Elements of Chemistry* (2 vols. Phila. 1853).

BOOTH, *bôth,* John Wilkes: 1839–1865, Apr. 26; b. Baltimore: actor. He was the assassin of Pres. Lincoln. The son of the English actor Junius Brutus B., he had more than ordinary power on the stage. In conspiracy with others, he shot the president in his private box at Ford's Theatre, Washington, D. C., 1865, Apr. 14. Rushing to the front, he exclaimed: '*Sic semper tyrannis!* The South is avenged,' and, leaping down upon the stage, made his escape. In his descent he broke his leg; but by the aid of an accomplice he rode 30 miles without resting. When overtaken by his pursuers, in a barn near Bowling Green, Va., he refused to surrender, and was shot.

BOOTH, JUNIUS BRUTUS: actor: 1796, May 1—1852, Nov. 3; b. London, d. on a Mississippi boat for lack of medical care; son of Richard B., a lawyer, and related on his mother's side to John Wilkes, the English statesman. B. was classically educated, tried painting, sculpture, poetry, worked for a time in his father's office, then got commission as midshipman and resigned because unwilling to serve against the United States. He appeared as amateur in a London theatre, then became a professional actor, and, 1814, made a professional tour through Holland and Belgium. As substitute for Edmund Kean one night in 1815, he captivated an audience at Worthing. B., as a rival of Kean, had, 1817, a misunderstanding with him, which was the occasion of a riot, when B. appeared at Covent Garden. After continued successes he performed with Kean 1820. He married Mary Anne Holmes 1821, Jan. 18, arrived with her at Norfolk, Va., 1821, June 30, and from that time till his death played in the chief cities of the country, gaining high esteem as an actor. His parts were Richard III., Shylock, Othello, Iago, Lear, Hamlet, Sir Giles Overreach, etc. In New Orleans he took parts in French as well as English. He managed Camp Street Theatre, New Orleans, 1828, Adelphi Theatre, Baltimore, 1831. He visited Europe 1825 and 1836. B. bought, 1822, a place in the woods in Hartford co., Md., 25 m. from Baltimore, to which his father came to live; there also B. retired when not engaged, but for the last 10 years of his life Baltimore was his retreat. After 1832 he suffered from attacks of insanity aggravated by intemperance. He had several children.

BOOTH, MARY LOUISE: author: 1831, Apr. 19—1889, Mar. 5; b. Yaphank, N. Y. She was precocious, and at the age of 14 taught in her father's school at Williamsburg, L. I., began translating from the French, and was engaged in general literary pursuits, and had made a reputation before she was 25 years old. She published Victor Cousin's *Secret History of the French Court; or, Life and Times of Mme. de Chevreuse* (1859); and in the same year her *History of the City of New York;* which in later editions became a standard authority. During the civil war, she translated from Gasparin Laboulaye, and other eminent French writers, their monographs on topics connected with that subject, furnishing most important material for future American historians of that period. Her *Results of Slavery* (1862) was highly commended by Lincoln, Sumner, and other statesmen. Her translations from Martin, Laboulaye, and other distinguished French authors brought her great repute. From 1867–89 she was editor of *Harper's Bazaar.*

BOOTH, MAUD BALLINGTON, a leader of the Volunteers of America: b. near London, 1865. She was active in the work of the Salvation Army in England, and established a corps of the Salvation Army in Switzerland. In 1887 she married Ballington Booth, and in 1896 joined him in seceding from the Salvation Army and organizing the

Volunteers of America. She has been active in work for prisoners, both during their imprisonment and after their release. She is author of *Branded* (1897); *Look Up and Hope; Sleepy Time Stories* (1899); *Lights of Childland* (1901); *After Prison—What?; The Curse of Septic Soul Treatment; Wanted—Antiseptic Christians;* etc.

BOOTH, WILLIAM, known as GENERAL BOOTH: founder of the Salvation Army: b. Nottingham, England, 1829, Apr. 6. At 15 yrs. of age he left the Established Chh.; at 17 became a lay preacher; at 24 left the Wesleyan Society and joined the Meth. New Connection, having already preached 18 months in London; but, 1865, he independently established in the East End of London the Christian Mission, out of which grew the Salvation Army (q.v.), which took this name 1878, and is now organized in 52 countries and colonies, with 18,556 officers, and has an income from all sources, including publications, of several millions of dollars. B. is the head of the organization, which must unquestioningly obey him. He is the author of its Orders and Regulations and of *In Darkest England* (1890), with other publications—partly in conjunction with the late Mrs. Booth. He has repeatedly visited the United States and other lands in the course of his laborious work, the sphere of which is among the poor and the outcast, for whom he has devised various schemes of practical help. His work has received the aid of many persons of prominence in different countries, and by general consent he is a man of sincerity and great ability.—Mrs. CATHERINE BOOTH, wife of William: 1829, Jan. 7—1890, Oct. 4; b. in Ashbourne, Derbyshire; d. London: a woman of superior power and devotion, known as the 'Mother of the Salvation Army.' Soon after marriage, she began to preach, and, when the Meth. New Connection declined to reappoint her husband to evangelistic work, she travelled with him as a fellow-evangelist, helped to found the London mission, and was accustomed to conduct services anywhere on occasion. To her influence is attributed much of the total-abstinence principle adopted by the movement, and the simplicity of dress of the women enlisted. Her judgment and her zeal are traceable also in its organization and administration. Among her works are *Aggressive Christianity* and *The Salvation Army in Relation to Church and State.* She prepared a volume of Reminiscences. An immense concourse of followers and of grateful poor gathered to witness her funeral. —WILLIAM BRAMWELL B., eldest son of William and Catherine B. (b. about 1856), has been the active 'chief of staff' of his father, and is regarded as his chosen successor.—BALLINGTON B., (q.v.), second son, entitled Marshal, married a lady of good family and fortune; became supt. of the Australian missions 1884, and afterward took charge of the work in the United States: see VOLUNTEERS, AMERICAN. His wife, MAUD (CHARLESWORTH, q.v.) B., was efficient in the Salvation Army.—A third son,

BOOTH.

HERBERT B., commands the men's dept. of the Training School, as a daughter, EMMA B., did the women's dept. (see BOOTH-TUCKER, EMMA MOSS).—*In Darkest England, and the Way Out*, gives statistics of vice and poverty in Great Britain, such as, in London, 51,000 inmates of workhouses and charitable institutions; 33,000 homeless; 300,000 living on between 18s. ($4.50) a week and starvation; 220,000 on 18 to 20s. intermittently; 387,000, the same regularly; total 993,000. On this basis, Gen. B. reckons a total in the United Kingdom of 165,000 idlers and criminals; 1,550,000 who fluctuate between casual earnings and want; 1,905,500 houseless or in workhouses and Asylums. Including those in penal institutions and reformatories, he sums up three millions of paupers and the abandoned. The remedy he proposes is threefold; a city colony that shall collect the outcasts, and give work, though of the simplest kind, such as collecting waste material, and shall give shelter and food, with factory employment as the work advances. From this organization is to be recruited suitable material for a country colony, where farming and gardening will be pursued, with any other industries, ultimating in co-operative villages. Again, from this are to be selected persons adapted to some foreign colonies on a larger scale. There are many details proposed—e.g., provision for the sick, for reformatories, for savings banks, etc. The colonies, it is suggested would grow up naturally, as in the far west, the people putting up the buildings and making the needed improvements. The book has met with the approbation of some eminent prelates and statesmen; and it has been criticised as not original in its conceptions, the plan having been essentially anticipated by Count Rumford, an American, 100 years ago, and the labor-colony idea being now in successful operation in Germany; to this success, Lord Meath appeals in defense of Gen. B., saying that the system has rapidly advanced there since 1882, with most gratifying results, the colonies numbering 22 in the country, besides one in Berlin and another in Magdeburg—a special feature of which is the earning of good clothes, tools, and some money, with which a man can go forth and readily find work. Prof. Huxley, on the other hand, points to the dire example of religious enthusiasm in the well-intentioned founder of Jesuitism, and a somewhat similar implicit obedience to a superior required in the Salvation Army, and, referring to the already large numbers and resources of the army, asks: 'Who is to say that the Salvation Army, in the year 1920, shall not be a replica of what the Franciscan order had become in the year 1260?' There certainly does not appear to be thus far a very striking likeness between the mixture of piety and jollity, the disregard of 'the church,' the charitable aims, the popular massing, of the Salvation Army, and the extreme secrecy, asceticism, and churchliness of Ignatius Loyola. See SALVATION ARMY.

BOOTH-TUCKER, *bôth-tuk'ėr*, Emma Moss, a leader in the Salvation Army: b. Gateshead, Eng. 1860, Jan. 8; d. 1903, Oct. 28. She was a daughter of William Booth, the organizer of the 'Army'; in 1880–8, she had charge of international training homes; in 1888 she married Commander Booth-Tucker, went with him to India, and in 1896 came to the United States. She held the rank of consul in the Salvation Army, and had joint authority with her husband in the United States.

BOOTH-TUCKER, Frederick St. George de Latour, American evangelist: b. Monghyr, Bengal, India, 1853, March 21. He held important official posts in India, but resigned them in 1881 to join the Salvation Army. Upon his marriage with Emma Moss Booth, daughter of 'Gen.' William Booth of the Salvation Army, he prefixed Booth to his own name of Tucker. From 1881–91 he was in charge of the Army in India and from 1891–6 was secretary for international work in London. From 1896–1904 he was commander of the Salvation Army in the United States, but resigned to become secretary of all the branches of the Army outside of Great Britain. He has written *The Life of Catherine Booth* (1892); *Life of General William Booth* (1898); *In Darkest India and the Way Out; Favorite Songs of the Salvation Army* (1899); *Monograph* for Paris Exposition on the *Work of the Salvation Army in the United States* (1900).

BOOTHAUK, *bô t'hawk':* fortified pass of Afghanistan, 12 m. e. of Cabul. It is a passage for 5 m. between cliffs 500 ft. high, and in some places only 50 yards wide.

BOOTHBAY, n. *bôth'bā:* town on the Atlantic coast in Lincoln co., Me., 13 m. s.e. of Bath. It has a good harbor open all winter, and is mainly engaged in trade and fisheries. B. is a summer resort with good hotels, boarding-houses, churches, schools, etc. Pop. (1890) 1,718; (1900) 1,766; (1910 est.) 2,000.

BOOTHBY, *bôth'bĭ*, Guy Newell, English novelist: b. Adelaide, South Australia, 1867, Oct. 13; d. London, England 1905, Feb. 27. In 1891 he crossed Australia from north to south, and also traveled in the East. His novels include: *On the Wallaby; A Bid for Fortune; Beautiful White Devil; Dr. Nikola; Fascination of the King; Billy Binks, Hero, and Other Stories; Across the World for a Wife; Pharos, the Egyptian; Love Made Manifest; Dr. Nikola's Experiment; A Sailor's Bride; A Maker of Nations; My Indian Queen; Farewell Nicola* (1901); and *The Viceroy's Protégé.*

BOOTHIA FELIX, *bô'thĭ-a fē'lĭks:* peninsula, forming the most northerly part of the American continent. Toward the s., it is terminated by an isthmus, while, to the n., it is bounded by Bellot Strait (q.v.). It was discovered by Sir John Ross during the most famous of his voyages, and named after his friend Sir Felix Booth (1775–1850) who had given £20,000 to assist the polar expedition. At the time it was supposed to reach as far n. as Barrow Strait.

BOOTHIA GULF: separating Boothia Felix on the w. from Cockburn Island on the e.; is a southward continuation of Prince Regent's Inlet.

BOOTLE, *bôt'l*, England, a municipal and county borough in Lancashire, near the mouth of the Mersey, and adjoining Liverpool, the docks of which great seaport extend into the borough, covering 370 acres and constructed at a cost of £2,500,000. The principal buildings are the town hall and municipal buildings, school-board offices, and hospital. Many churches provide for the public worship of the inhabitants. The trade of the town is almost exclusively connected with shipping, timber being the chief import; most of the American steamers have their loading berths here. There are large jute-mills, corn-mills, foundries, etc. Bootle has ample railway facilities and tramway cars. The Leeds and Liverpool Canal passes through it. There is a municipal electrical station. The history of the place is included in that of Liverpool. It was incorporated in 1868. Pop. (1901) 58,558.

BOO'TON: island near the s.e. of Celebes, between 4° 25′—5° 45′ s. lat., and in 123° 4′ e. long; 1,807 m. It is mountainous and thickly wooded, produces fine timber, rice, maize, sago, etc. There are buffalo, swine, horses, and goats. The people are Malays. The chief town, Booton, is walled, and there fine cottons and other stuffs are made. The sultan is in alliance with the Dutch. Pop. 17,000.

BOOTS: leather coverings for the legs and feet, a lengthened variety of shoes; among the most ancient articles of attire. Shoes, extended a certain height up the leg, laced, ornamented, and of fanciful colors, were in use by the ancient Egyptians, Greeks, and Romans, as is seen by existing relics and drawings. For these and other varieties of shoes, also for the trade and manufacture of shoes and boots generally, see SHOE-TRADE. Different kinds of half-boots were worn by the Anglo-Saxons and Anglo-Normans; and in the reign of Edward IV., if not earlier, the boot-proper with tops and spurs, was established as an article of knightly dress. In the reign of Charles I., a species of boot, exceedingly wide at the top, made of Spanish leather, came into use; and with Charles II., the highly decorated French boot was introduced as an article of gay courtly attire. Meanwhile, the jack-boot, as it is called (see JACK), had become indispensable in the costume of cavalry soldiers and horsemen generally; and by William III. and his followers it was regularly naturalized in England. Strongly made, the jack-boot extended in length above the knee, was capacious at top, had a very high heel, and round the ankle, it had a flat leather band bearing a powerful spur. This species of boot remained in use in British cavalry regiments until comparatively recent times, and was dismissed as too cumbrous for men dismounted. It is, nevertheless, in a somewhat improved form, still worn by the Horse-guards.

The jack-boot is almost entitled to be called the parent

of the top boot and some other varieties. By jockeys and fox-hunters, they are likely to remain in permanent use. What perhaps contributed to the general disuse of top-boots, was the introduction of the Hessian boot as an article of walking-dress. At length they were superseded by the well-known Wellington boot, which, as its name imports, was introduced by the great duke, as a simplification, under the loose military trouser.

BOOTY, n. *bô′tĭ* [Sw. *byte*, exchange, barter—from *byta*, to exchange or divide: Dan. *bytte*, spoil: F. *butin;* It. *bottino*, plunder: Ger. *beute*, booty: Gael. *buaidh*, conquest]: spoil gained from the enemy; plunder, pillage: it is the victor's share in property captured from the vanquished. It is generally a military term, the word *prize* being more frequently used in the navy. Prize and B. originally belonged to the sovereign, and are only distributed to the captors as an act of grace; for if the sovereign (in the United States, the govt.) pleases, the property can be given back again to the enemy. See PRIZE. FREEBOOTER, n. *frē′bôt-ėr* [*free*, and *booty*]: one who makes war for plunder only.—SYN. of 'booty': pillage; plunder; rapine; spoil; prey.

BOOZER, n. *bô′zėr* [Colloq.]: one who drinks to excess. BOOZY, a. *bô′zi* [Colloq.]: slightly intoxicated; fuddled.

BOPP, *bŏp*, FRANZ: 1791, Sep. 14—1867; b. Mainz: ordinary prof. of oriental languages, at Berlin Univ. Devoting himself exclusively to the study of oriental literature, he spent some years in Paris, where he was encouraged in his labors by Chezy, Silvestre de Sacy, and August Wilhelm Schlegel, and afterward visited London, to prosecute his favorite studies more thoroughly, being partly supported by a small pension from the king of Bavaria. His first publication was on the Sanskrit verb; he afterward produced a Sanskrit Grammar, a *Glossarium Sanscritum*, and editions of several fragments of the great Indian epic, the *Mahabharata*, in the original text, with a translation. He greatly facilitated the study of Sanskrit in Europe. But his most important labors centered in the analysis of the grammatical forms of the different languages of the Indo-Germanic family, by which he may be said to have founded a new science of Comparative Grammar. His great work in this department is a Comparative Grammar of the Sanskrit, Zend, Greek, Latin, Lithuanian, Old Slavonian, Gothic, and German (*Vergleichende Grammatik*, etc., Berl. 1833, etc., second ed., entirely recast, 1857). An English translation by Lieut. Eastwick, conducted through the press by Mr. Wilson, Boden prof. of Sanskrit in Oxford Univ., was published in 3 vols. 1845–50. In recognition of his splendid services to philology, he was, 1842, made a knight of the newly erected French *Ordre du Mérite*, and in 1857, foreign associate of the French Institute.

BOPPARD, or BOPPART, *bŏp′pârt* (ancient *Baudobriga*) walled town of Rhenish Prussia, on the left bank of the Rhine, about 9 m. s. of Coblenz. B. is a very ancient

place, with dark, narrow streets, and is built chiefly of wood. Its appearance, however, is picturesque, and it has several buildings, architecturally remarkable. The church of the Carmelites contains some fine specimens of 16th c. sculpture. During the middle ages, B. was an imperial city, and many councils were held in it. Remains of the Roman fortress built by Drusus are still seen. Near B. is Marienberg, the famous hydropathic resort. Pop. 5,500.

BORA, n. *bō′rā* [L. *bŏrĕās*, the mountain or north wind]: a wind which descends from the Julian Alps, and sweeps over the Adriatic Sea—a bitterly cold, tempestuous wind.

BORA, *bō′râ*, Katharina von, or Catharine de Bora' wife of Martin Luther: 1499, Jan. 29—1552, Dec. 20; b., it is supposed, at Löben, near Schweinitz, Saxony. At a very early age, she entered the Cistercian convent of Nimptschen, near Grimma. Becoming acquainted with Luther's doctrines, she found herself very unhappy in her monastic life; and finally, with eight other nuns, whose relatives, like her own, refused to listen to them, she applied for assistance to Luther. Luther obtained the services of Leonhard Koppe, a citizen of Torgau, and by him and a few associates the nine nuns were liberated from the convent, 1523, Apr. They were brought to Wittenberg, where Luther had suitably provided for their reception. Catharine became an inmate of the house of the burgomaster Reichenbach. Luther, through his friend, Nicholas von Amsdorf, minister in Wittenberg, offered her the hand of Dr. Kaspar Glaz, who became pastor in Orlamünde. She declined this proposal, but declared herself ready to marry Von Amsdorf, or Luther himself, who had already laid aside his monastic dress. Her marriage with Luther took place 1525, June 13, and was made the occasion of much reproach by his enemies, which, though without foundation, has not ceased to be repeated to this day. In his will, he left her all that he had, so long as she should remain a widow, because, as he says, she had always been an affectionate and true wife to him. After Luther's death, the Elector of Saxony and Christian III. of Denmark contributed from time to time to her support. She died at Torgau.

BORACHIO, n. *bō-răch′ĭ-ō* [Sp. *borracha*, a bottle, usually of a pig's skin, with the hair inside, dressed with resin and pitch, to keep wine or liquor sweet: compare Gael. *borracha*, a bladder—from *borra*, to swell]: a bottle or cask; a drunkard.

BORACIC, a. *bō-răs′ĭk* [see Borax]: of or from borax. Boracic acid, a white solid substance, a compound of boron and oxygen. Boracite, n. *bŏr′ă-sīt*, an anhydrous mixture of borate and chloride of magnesium. Borate, n. *bō′rāt*, a salt of boracic acid.

BORAC′IC ACID, or Boric Acid: compound of boron, hydrogen, and oxygen, $B(OH)_3$, or $3H_2O,B_2O_3$; found in solution in the hot lagoons of Tuscany, which yield a large

supply of it. It is easily prepared by decomposing with sulphuric acid a hot solution of Borax (q.v.), which is a borate of sodium, abundant in the salt lakes of the United States, India, Thibet, and other parts of Asia. B. A. is made from the borax of Borax Lake, in Cal., by decomposing it with hydrochloric acid. B. A. crystallizes in transparent six-sided plates, soluble in abt. 25 parts of cold water; much more soluble in boiling water. It has but little taste, and differs considerably from the stronger acids in its action on vegetal colors, imparting to blue litmus paper only a wine-red color, like that produced by carbonic acid; and tumeric paper a brown color, like that produced by alkalies, but easily distinguished therefrom by the fact of its not disappearing on the addition of an acid. The crystallized acid, when heated, gives up water and melts with great tumefaction to a glassy transparent mass of boric oxide, B_2O_3, which readily dissolves many metallic oxides, with very characteristic colors, e. g., deep blue with oxide of cobalt, amethyst with manganese, bright green with chromium. The crystallized acid dissolves in alcohol, and the solution burns with a green flame.—B.A. is used in the arts as a flux, as an ingredient in the glaze employed in pottery, and the wicks of stearine and composite candles are treated with it, so that when the candle is burning, the end of the wick, as it lengthens, may fuse and fall to the side, where it can be burned away. As an antiseptic and preservative of food, B. A. is used more than any other antiseptic—either alone or with borax—in preserving butter, milk, wine, beer, meat, and fish. Its desirableness for this use is still much discussed, but as yet there is no authentic evidence of evil results from it. In surgery B. A. is extensively used as an antiseptic. The powder is used dusted on ulcerating surfaces, and on fresh wounds, to prevent suppuration. Aurists blow it into the cavity of the middle ear to check the formation of pus. Dissolved in water, it is one of the most frequent lotions prescribed by the oculist, in cases of catarrhal inflammation of the eyes, being very bland and unirritating. *Boro-glyceride*, prepared by heating B. A. with glycerine, has very valuable antiseptic properties.

BORAGE, n. *bŏ′rāj* [F. *bourrache*, borage—from It. *borragine*—from mid. L. *borrag′ĭnem*—from *borra* or *burra*, rough hair], (*Borāgo*): genus of plants of nat. ord. *Boraginaceæ* (q.v.); having a wheel-shaped corolla, the mouth of which is closed with five teeth, and forked filaments, of which the inner arm bears the anther, the anthers connivent around the style, in the form of a cone. The species are few, chiefly natives of the countries around the Mediterranean Sea. The Common Borage (*B. officinalis*) is found in waste places in many parts of Europe, and is frequent—perhaps naturalized—in Britain. It is a plant of rather coarse appearance, with a stout erect herbaceous stem, 1–2 ft. high, somewhat branched; the lower leaves elliptical, obtuse, tapering to the base; the stem, leaves,

flowerstalks, and calyx rough with hairs. The flowers are more than half an inch broad, of a beautiful blue color. B. was formerly much cultivated and highly esteemed, being reckoned among the *cordial* flowers, and supposed to possess exhilarating qualities, for which it no longer receives credit. Its leaves impart a coolness to beverages in which they are steeped; and with wine, water, lemon, and sugar, enter into the composition of an English drink called a *cool tankard*. The young leaves and tender tops are pickled, and occasionally boiled for table.

BORAGINEÆ, or BORAGINACEÆ, *bō-răj-ĭ-nā′sē-ē*: natural order of dicotyledonous plants, chiefly herbaceous, but also containing shrubs and even trees; the leaves generally rough with hairs which proceed from a thick hard base, and the whole plant mucilaginous and emollient. The leaves are alternate and without stipules. The flowers are in spikes, racemes, or panicles which are almost always coiled up, and gradually uncoil and elongate themselves, the flowers expanding in succession. The calyx is 4–5-partite, and remains till the fruit is ripe, the corolla is generally regular, 4–5-cleft, imbricated in bud; the stamens rise from the corolla, and are equal in number to its divisions—generally five—and alternate with them. The ovary is 4-partite, 4-celled; the style simple, arising from the base of the lobes of the ovary. The fruit consists of 4—or sometimes of 2—distinct achenia: see ACHENE.—The order *Ehretiaceæ* of some botanists differs chiefly in the fruit, which in the more typical species is a succulent drupe; and in the Heliotropes consists of four dry achenia more or less consolidated.—There are about 600 known species of the proper *Boragineæ*, and about 300 of *Ehretiaceæ*. The former are natives principally of temperate climates, and are particularly abundant in the s. of Europe and in the temperate parts of Asia; the latter are more tropical, but not exclusively so. BORAGE (q.v.), ALKANET (q.v.), COMFREY (q.v.), and FORGET-ME-NOT (q.v.), are familiar examples of the former. There are many species in N. America including, besides the above, Blueweed, Bugloss, and the beautiful Lungwort (*Mertensia Virginica*).

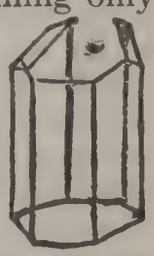
BORAK, n. *bō′răk*: see AL-BORAK.

BORAS′SUS: see PALMYRA PALM.

BORAX, n. *bō′răks*, or BIBORATE OF SODA [Ar. *baurac* or *búraq*, a species of nitre; F. *borax*; Sp. *borrax*]: saline incrustation found native on the shores of some lakes in Persia, Thibet, Nevada, and California; also occurring widely scattered over the world. Till comparatively recent years, the main source was the crude article brought from Thibet in skins, and called *tincal*. In 1856 the California sources of B. were discovered; the bottom of a lake being found covered to a depth of abt. 18 inches with mud impregnated with B. and containing large crystals of it. From this mud, by treatment with hot water and crystal-

lization, there is obtained first *concentrated* B., and by further treatment this yields the *refined* B. In other places in Cal. the B. is found mixed with sand in a light granular form, containing abt. $\frac{1}{18}$th of the pure salt, while large crystalline masses of it occur below the surface of the ground. In all these cases a similar method of purification is adopted. The production of B. in the Pacific states was: (1872) 280,000 lbs.; (1884) 3,732,000 lbs.; (1887) 11,000,000 lbs.; (1895) 11,918,000 lbs.; (1900) 51,674,000.; (1905) 91,294,000 lbs., worth $698,810.00. In Europe large quantities of *artificial* B. are prepared from the Boracic Acid (q.v.) of Tuscany. This, mixed with carbonate of soda, is heated in a furnace, carbonic acid being liberated, and the crude salt is then dissolved in water to free it from impurities, and crystallized.

The common variety of B. contains 10 equivalents of water, $Na_2B_4O_7+10H_2O$, and forms prismatic crystals; but another variety exists, *octahedral* B., containing only 5 molecules of water. B. is soluble in 12 times its weight of cold water, and in half its weight of boiling water, yielding a clear solution with slightly sweetish taste. It is of great use in the chemical arts owing to its properties of dissolving metallic oxides, and of forming a flux when heated with other substances. On this account it is much used in connection with the Blowpipe (q.v.), before which it yields different colored glasses corresponding to the metals present. It is used as a mordant in calico-printing and as an adjunct to, or substitute for, soap in washing. As an insecticide, it is very powerful, specially destructive to cockroaches. For preserving meat, fish, butter, and milk, either alone or along with Boracic Acid (q.v.), B. has wide application. Besides these technical uses, B. is much used in medicine as an antiseptic, being applied in powder or as a lotion to ulcerating surfaces, and in the treatment of the infantile disease thrush; also in lozenges for relieving the hoarseness of public speakers.



Crystal of Borax.

BOR'BECK: town of Prussia, about 20 m. n.e. of Dusseldorf, some 10 m. from the Rhine. It has important iron industries, and coal is mined in the neighborhood. Pop. 29,000.

BORBORYGMUS, n. *bŏr'bŏr-ĭg'mŭs* [Gr. *bŏrbŏru'zo*, I produce a rumbling in the bowels]: the gurgling noise produced by the movement of wind in the intestines.

BORCER, n. *bŏr'sẽr* [from Bore 1]: an instrument for boring holes in large rocks in order to blow them up.

BORD, n. *bŏrd*, a miner's term for the face of coal parallel to the natural fissures.

BORDA, *bawr-dâ*, Jean Charles: 1733, May 4—1799, Feb. 20; b. Dax, dept. of the Landes, France: practical mathematician and astronomer. In 1771, he was associated with Verdum and Pingré in proving the accuracy of chronometers. He also studied ship-building, and

suggested great improvements in the form of vessels. In 1787, he was active in bringing the observatories of Paris and Greenwich into closer relations with one another. With Delambre and Méchan, he was prominent in the French commission intrusted with the measurement of a meridian arc. He rendered essential service in the commission on the new system of weights and measures, and invented a new instrument for measuring the inclination of the magnetic needle; and his corrections of the seconds pendulum are still in use. But his reputation depends mostly on his improvement of the reflecting circle, on which instrument he published a work in two vols. (Par. 1787). He died in Paris.

BORDEAUX, *bawr-dō'*, important seaport town of France, chief town in the province of Gironde, beautifully situated in a plain on the left bank of the Garonne about 60 m. from its mouth in the Atlantic. Ships of more than 1,000 tons burden can easily ascend the river at high water to B., which is accessible at all times to vessels of 600 tons. Its harbor is very capacious; and, by the Garonne, its commerce very extensive. The river is crossed by a noble bridge of 17 arches, 532 yards in length, erected by the elder Deschamps, 1811–21. The old town, consisting partly of high wooden houses of the 15th c., has narrow crooked streets; but the newer parts of the city and the suburbs have wide streets, fine squares, and pleasant promenades lined with trees. The cathedral, consecrated 1096, is remarkable for its beautiful towers. The church of St. Croix is of the 10th c.; that of St. Seurin also is very old, and has rare Gothic ornaments. The former archiepiscopal palace is now the town hall. The Great Theatre is one of the largest and finest buildings of its kind in France. B. has many other fine public buildings, and learned associations, and educational and benevolent institutions, with a public library of upward of 140,000 vols. The univ., founded by Pope Eugenius IV., 1441, has been, since 1839, an *Académie Universitaire*.

Among principal branches of industry are the production or preparation of sugar, brandy, liqueurs, vinegar, nitric acid, principal calicoes, woolen goods, carpets, hats, paper, earthenware, glass bottles, metallic wires, madder, and resinous articles. The rope-works, cooperages, and dock-yards are extensive and full of activity. The Canal du Midi, connecting B. with the Mediterranean, enables it to supply the whole south of France with the colonial produce which it imports; and also with English tin, lead, copper, coal, dye-stuffs, herrings, etc. Wine, brandy, vinegar, dried-fruits, hams, turpentine, and glass bottles are among its principal exports.

Except the wines of Champagne, no French wines are so much exported to foreign countries as those grown in the district of B. and known as Bordeaux Wines. Some of them are red (*Claret*), others white. Of the red wines the Medoc is one of the best known. The red wines produced by the vineyards of Lafitte, Latour,

Château-Margaux, and Haut-Briou are particularly celebrated for their quality. The white wines of Graves, and those of Sauternes, Barsac, Preignac, and Langon are in highest repute.

In former times, B. was called *Burdigala*, and was the capital of the *Bituriges Vivisci*. It was a very prosperous town in the times of the Romans, was made by Hadrian the cap. of Aquitania Secunda, and was both the principal emporium of the s.w. of Gaul, and the seat of its best educational institutions. It was taken by Charles Martel, 735; but was again spoiled by Norman plunderers in the 9th c. It became the cap. of the duchy of Guienne; and in 1152 passed, by the marriage of Eleanor of Guienne with Henry of Normandy (afterward Henry II. of England), under the dominion of England. B. was for a considerable time the seat of the splendid court of Edward, the Black Prince.

During the Revolution, B. was the principal seat of the Girondists, and suffered fearfully at the hands of the Terrorists. Its inhabitants, disaffected to Napoleon's government, were the first to declare for the Bourbons in 1814. During the Franco-Prussian war a delegation of the Government of National Defense, retreating before the advancing German army, stationed itself, 1870, Dec., at B.; and the first sittings of the national assembly, 1871, were held there. Pop. (1901) 257,638.

BORDEAUX MIXTURE: see FUNGICIDES.

BORDEL, n. *bŏr'dĕl*, or BORDELLO, *bŏr-dĕl'lō* [It. *bordello*, a little house—from L. *bordus*, a house]: a brothel; a house of ill fame.

BORDEN, *bawr'dĕn*, HON. SIR FREDERICK WILLIAM, Canadian politician, b. 1847, May 14. He was educated at the University of King's College, Windsor, Nova Scotia, and the Harvard Medical School; began practice of medicine 1868; was appointed assistant surgeon of the 68th battalion 'King's County' Militia 1869; is now surgeon, lieutenant-colonel and honorary colonel of the Canadian Army Medical Corps. Since 1874, with the exception of the years 1883–6, has represented Riding (King's, N. S.) in the House of Commons and since 1896 has been Minister of Militia Defence. He was knighted in 1902.

BORDEN, GAIL: 1801, Nov. 6—1874, Jan. 11; b. Norwich, N. Y. He became a teacher in Miss. 1822, was also a govt. surveyor; removed to Tex., became prominent in political affairs, arranged for the surveys and the first map of the colony, founded a newspaper, surveyed the city of Galveston, and was the first collector of that port. He invented various concentrated foods, of which condensed milk gave him a worldwide reputation. He also devised methods for concentrating tea, coffee, and the juices of fruits.

BORDEN, SIMEON: 1798–1856; b. Fall River, Mass.: civil engineer and inventor, self-educated. In 1830,

he invented an instrument for measuring base-lines in trigonometrical surveys which proved superior to any then in existence. It was inserted in a tube 50 ft. in length, and accompanied by four compound microscopes. From 1834–40, he superintended the state survey of Massachusetts, the first geodetic survey in America.

BORDENTOWN, *bawr'dėn-town*, a city of Burlington co., N. J., on the Delaware river, and on the Pennsylvania railroad, 28 m. from Philadelphia and 6 m. s.e. of Trenton, at the terminus of the Delaware & Raritan canal. It has large industrial, agricultural, and commercial interests, manufacturing iron goods, worsted, machinery, ships, bricks, etc. It is also a residential and educational centre, numbering among its institutions B. Military Institute, and the former home of Joseph Bonaparte, brother of Napoleon I. Pop. (1900) 4,200.

BORDER, n. *bawr'der* [F. *bord*, and *bordure*, border, edge: AS. and Icel. *bord;* Sp. *bordar*, to edge, to embroider]: the outer edge or part of anything; the surrounding line or limits of a large or small tract of land: V. to be near to; to reach to; to adjoin; to adorn with a border; to ornament; to limit. Bor'dering, imp. Bor'dered, pp. *-dėrd.* Bor'derer, n. *-dėr-ėr*, one who dwells at or near the boundary of a country.—Syn. of 'border, n.': boundary; bounds; frontier; confines; precinct; limit; purlieu; edge; verge; brink; brim; rim; margin.

BOR'DER, The: in historical and popular phraseology, the common frontier of England and Scotland: applicable also to the common frontier of any adjacent countries. At present, the dividing boundary of England and Scotland consists partly of natural and partly of imaginary outlines. It is customary to speak of Scotland as a country 'north of the Tweed;' but the Tweed is the boundary only in a small part of its course, on the east; and large portions of several Scottish counties lie s. of that river. The Tweed forms the division only for about 16 to 18 m. Leaving the river at Carham Burn, a few m. above Coldstream, the line proceeds toward the Cheviot mountains, the ridge of which is the boundary for about 25 m.; descending thence, the line strikes on Kershope Water, tributary of the Esk. That river is the boundary for a number of miles to a point above Longtown. The line now quits the Esk abruptly in a n. direction, and taking into England part of what was known as the 'Debatable Land' (q.v.), strikes on the small river Sark, which is the boundary as far as to the Solway Firth, the great natural division on the west. The entire boundary from sea to sea is about 100 m. in length.

From the 11th till the end of the 17th c., there was almost constant disturbance on the border. Ruthless wars on a great scale between English and Scots sometimes caused most frightful devastation, and became the source of lasting ill-will on both sides. Among the latest of the regular invasions from England was that in 1543,

in the reign of Henry VIII., conducted by the Earl of Hertford. After the accession of James to the English throne, a sweeping clearance of the Scottish border was effected. At the same time, the Debatable Land was cleared of the Græmes, a daring sept of freebooters, who were transported to Ireland, and their return prohibited under pain of death. The legislative union of 1707, and the firm administration of justice, along with a general improvement in manners, terminated the long disorder.

In the present day, there is nothing to distinguish the border from other districts, unless it be the picturesque ruins of old castles, generally roofless, but from the vast thickness and strength of the walls, still in good preservation. The border strongholds were of three kinds—regular fortresses, large baronial castles, and the smaller kind of towers. On the e. the English owned the fortified town of Berwick, and at no great distance Newcastle-on-Tyne; and on the west, Carlisle. The chief Scottish border fortresses were the royal castles of Roxburgh, Jedburgh, and Lochmaben; and Edinburgh Castle might almost be included, for it is only 60 m. distant. The smaller kind of towers on both sides of the frontier appear to have been exceedingly numerous, and it is their remains that form the more conspicuous memorials of old border strife. Local intercourse across the border is considerably obstructed by the long range of hills and the moors which generally lie on the line of boundary; and the circumstance of the peculiar civil and ecclesiastical institutions of the two kingdoms, still further tends to lessen community of feeling. The great channels of communication across the border are two railway routes, one by way of Berwick, and the other by Carlisle. There are also good roads in various directions.

BORDEREAU, n. *bōr-dėr-ō*, [F.]: a memorandum of the contents of documents which it accompanies.

BORDER STATES: before the Civil War, the line of slave States lying next the free States: Delaware, Maryland, Virginia, Kentucky, and Missouri. The term was sometimes improperly made to include North Carolina and Tennessee, probably because their mountain districts held so large a proportion of loyalists; and Arkansas, for no special reason. Their political position was dictated by the facts that: (1) After the prohibition of the slave trade one of their chief industries was breeding slaves for exportation to the cotton, rice, and sugar plantations of the southernmost States. In the Virginia convention of 1832 it was said to be the most profitable in the State. (2) From their position they were the chief sufferers from the escape of fugitive slaves; in 1850 this was estimated at a loss of $3,000,000 a year, and these States were the most insistent advocates of the Fugitive Slave Law and its enforcement; and in 1860 a Missouri senator urged the creation of a Federal police to patrol the border line for this purpose. (3) In case of war they would be the chief battlefield. They therefore furnished the backbone,

if not the genesis of every political movement to stop the slavery agitation or conciliate the sections. The strength of the Know-Nothing party of 1856 and the Constitutional Union party of 1860 (Bell-Everett) was almost exclusively in the border States; the Peace Conference of 1861 and the proposed Crittenden Compromise were the work of these States. They tried to prevent the outbreak of hostilities, and when the war began the governor of Kentucky went so far as to attempt making his State a neutral power outside both governments, and forbade either of them occupying it without the consent of the State authorities. Finally, however, they split up according to their natural affinities; the three not border States at all—North Carolina, Tennessee, and Arkansas—seceded, with Virginia; while in Kentucky, Maryland, Delaware, and Missouri, the loyal element, with government help, prevented the State from going out. They never gave up hope through the war, however, of reconciling differences by a convention of all the old States, North and South.

BOR'DER-WARRANT, in the Law of Scotland: warrant issued by the judge ordinary on the borders between Scotland and England, on petition of a creditor who desires to arrest the person or effects of a debtor residing on the English side. These warrants are not frequent. For the similar warrant in English and American practice, for arrest of an absconding debtor including any foreigner who may be in England on business or pleasure, see Arrestment for Founding Jurisdiction: Debtors, Absconding: Foreign Attachment: Jurisdiction.

BORDIGHERA: small town of the Riviera, n. Italy, frequented as a health-resort. It is on a hill overlooking the Mediterranean, between Mentone and San Remo.

BORDONE, *bōr-dō'nā*, Paris: about 1500 (or 1510)–1570 (or 1588); b. Treviso: Italian painter of the Venetian school. His first master was Titian; but he soon left him to study the works of Giorgione, whose style he adopted. Among his master-pieces are *Fisherman presenting the Ring of Saint Mark to the Doge; Venus and Adonis;* a *Madonna surrounded by several saints; The Martyrdom of Saint Andrew;* a *Paradise.* As a portrait painter, B. was almost the equal of Titian.

BORDURE, *bawrd'yôr*, or Border, in Heraldry: a frequent surrounding of coats of arms, the object of which is generally to show that the bearer is a cadet of the house whose arms he carries. The character of the B. often has reference to the profession of the bearer: thus, a B. *embattled,* is granted to a soldier; a B. *ermine,* to a lawyer.

BORE, v. *bōr* [Ger. *bohren;* Icel. *bora;* L. *forārĕ,* to bore: Fin. *purra,* to bite: Gael. *bodhair,* to stun with noise]: to bite or gnaw through; to make a hole in a hard body with some tool; to perforate; to pierce; to annoy by repeated applications; to harass by importunity or iteration: N. the hole made by piercing or boring with a tool; the

cavity or hollow in anything, as in a gun-barrel; a person or thing that annoys. Bo'RING, imp.: N. the operation of piercing holes; a perforation. BORED, pp. *bōrd.* Bo'RER, n. one who, or that which. BOREDOM, n. *bōr'dŭm*, realm or domain of bores; the state or condition of bores. BORING-BAR, a bar supported axially in the bore of a piece of ordnance or cylinder, and carrying the cutting tool, which has a traversing motion, and turns off the inside as the gun or cylinder rotates; a cutter stock used in other machines *Note.*—BORE, in the metaphorical sense of 'to weary and annoy with talk and attentions,' is also referred to *bur*, as its original spelling, which, in that case, would literally mean 'a person who, by persistent importunity, sticks to one as close as a *bur* does to the clothes.'

BORE, v. *bōr:* pt. of BEAR, which see.

BORE, n. *bōr* [a word imitative of the sound produced: Icel. *bara;* Norw. *baara*, a wave or swell: variously expressed in English by *aigre*, *eagre*, or *hygre*]: the advancing front of the tidal waves as it ascends certain rivers or estuaries, especially at a spring-tide. *Note.*—In the river Hooghly it is called the *ban*, or swell of the tide; in the river Seine it is called *barre:* the name may be identical with Eng. *bar*, an impediment across a river, which the advancing tidal-wave always creates; in the river Ouse it is named the 'ægre, or egre.'

When a river expands gradually toward a very wide mouth, and is subject to high tides, the spring flood-tide drives an immense volume of water from the sea into the river; the water accumulates in the estuary more rapidly than it can flow up into the river; and thus there is gradually formed a kind of watery ridge stretching across the estuary, and rushing up toward the river with great violence. In some cases this ridge, or B. is many feet in height, and contends against the descending stream with frightful noise. This phenomenon is observable in several British rivers, as the Severn, Trent, Wye and Solway. The most celebrated bores are those of the Ganges, Brahamaputra, and Indus: in the Hooghly branch of the Ganges, the B. travels 70 m. in 4 hours, and sometimes appears suddenly as a liquid wall 5 ft. high. The Bay of Fundy has the largest B.—the tide being said to have at certain seasons a rise and fall of 60 or 70 ft.

BORE: the internal cavity of a cannon, mortar, howitzer, rifle, or other kind of firearm. In most cases it is cylindrical, and either *smooth* or *rifled*. In the United States the B. is cylindrical; but the English Lancaster and Whitworth guns have oval and hexagonal bores respectively. Technically, the B. of a gun often means simply the diameter of the internal cavity, and in that case is equivalent to calibre. For the process of boring of a cannon, see CANNON FOUNDING. The B. of a gun may be enlarged by an operation called 'boring up.' In the United States this is done usually for the purpose of 'converting' smooth-bore cast-iron guns into rifled guns of smaller calibre, by insert-

ing a lining-tube of coiled wrought iron, having the spiral grooves called rifles. Rifled guns have far greater accuracy and longer range than smooth-bores of equal calibre (see RIFLED ARMS).

BOREAL, a. *bō′rē-ăl* [L. *borĕăs*, the north wind: Russ. *borei*]: northern; pertaining to the north, or to the north wind. BOREAS, n. *bō′rĕ-ăs*, the north wind.

BO′REAS: Greek name of the northeast wind, blowing toward Hellas from the Thracian mountains, and personified in mythology as the son of Astræus and of Eos or Aurora, and the brother of Notus, Zephyrus, and Hesperus. B. as said to dwell in a cave of the Thracian Hæmus, to which he carried Oreithyia, the daughter of the Athenian king Erechtheus, who bore him Zetes and Calais—employed as the symbols of swiftness—and Cleopatra, the wife of Phineus. According to Homeric fable, he begat, with the mares of Erichthonius, twelve horses of extraordinary fleetness. The rape of Oreithyia was represented on the ark of Cypselos, where B. instead of feet has the tails of serpents. He had a temple in Athens, because he destroyed the ships of the Persians under Xerxes; and at Megalopolis, a yearly festival was celebrated in his honor, because upon one occasion he helped the Megalopolitans against the Spartans.

BORECOLE, n. *bōr′kōl*, or CURLED COLEWORT [see COLEWORT]: a hardy species of kale, whose leaves are loose and curled or wrinkled; Scotch kail; the *Brăs′sĭca olĕrăcĕă*, ord. *Crucĭfĕræ*. See KALE.

BOREE, n. *bō-rē:* an Irish dance said to have been brought from Biscay.

BOREL, n. *bŏr′el* [O. F. *borel* or *burel*, coarse cloth made of the undyed wool of brown sheep, in former times the dress of the lower orders]: in *OE.*, the coarse cloth or undyed wool forming the dress of the lower orders; a light stuff with a silken warp and woolen woof; the unlearned and common people, in contradistinction to priests or clerks; rude fellows: ADJ. dressed in borel; rude; unlettered.

BORELLI, *bō-rĕl′ē*, GIOVANNI ALFONSO: 1608–79; b. Naples; mathematician and astronomer, founder of the iatro-mathematical school. He was educated at Florence, and became prof. of mathematics at Pisa and afterward at Messina. Having taken part in a revolt, he was obliged to leave Messina, and spent the remainder of his life at Rome, where he had the patronage of Queen Christina of Sweden, and where he died. He carefully observed the motions of the satellites of Jupiter, then little known, and seems to have been the first to discover the parabolic paths of comets. He made valuable observations on a malignant fever in Sicily, and wrote a treatise on causes of such fevers. He wrote also an account of an eruption of Etna, and a number of works on subjects of applied mathematics, of which the most celebrated is that *De Motu Animalium* (Rom. 1680–1). In this work, he applied

the laws of mechanics to the motions of animals, regarding the bones as levers, in which the power acts between the weight and the fulcrum, and endeavoring to calculate the power of muscles from a consideration of their fibrous structure, and the manner in which they are united to the tendons. All more recent authors on this subject have been much indebted to Borelli.

BORER: name common to wood-borers, in part larvæ of moths (e.g., 'the peach-tree B.,' an Ægerian, and one of the locust-tree borers, *Xyleutes robiniæ*); but mostly beetle-larvæ of various families, especially the Buprestians and the Capricorns (*Cerambycidæ*). Almost every kind of tree is injured by the B. In the family *Ptnidæ* are small larvæ that bore the woodwork of furniture and houses; some penetrate library books also. The species of different countries are liable to be transported in furniture and lumber. The holes are filled up, as the insect works his way onward, with a fine powder, formed from the wood which it has eaten; and the pupa is formed near the wood surface. Having passed through the pupa state in its hole it emerges a winged insect. One of the most common British species is *Anobium striatum*, a dark-brown insect, not much above one line in length. The thorax, as in the whole tribe, is proportionately very large, and has a swollen hood-like appearance, the head being, as it were, received within it. This insect has long been noted for the pertinacity with which it simulates death. This instinct appears to be common to the whole tribe, as it is also to many other insects. Another species of the same genus, *Anobium tesselatum*, has become an object of interest as one of the insects which, being sometimes heard to make a peculiar ticking noise, are connected with superstitious fancies and fears, and receive the name of Death-watch (q.v.).

BORGHETTO, *bawr-get'tō*, town of Sicily, province of Palermo, 13 m. w.s.w. from Palermo. It is a long straggling town, of mean houses, but picturesquely situated on a wooded cliff overhanging a plain, and itself overhung by a lofty precipice of red rock. Pop. 7,000.

BORGHESE, *bawr-gā'zā*, family of great distinction in the republic of Siena, and afterward at Rome.

Camillo B. ascended the papal throne 1605 as Paul V., and by him other members of the family were advanced to high positions. A marriage with the heiress of the family of Aldobrandini brought the B. family into the possession of great wealth.

Camillo Filippo Ludovico B., Prince B.: 1775–1832; b. Rome: joined the French army when it invaded Italy; and in 1803 married Pauline, sister of Napoleon Bonaparte, and widow of General Leclerc. His wife subsequently received the principality of Guastalla, and he was created Duke of Guastalla, and under the French empire he was for some time gov.gen. of the provinces beyond the Alps. He held his court at Turin, and was very popular among

the Piedmontese. He sold the B. collection of artistic treasures to Napoleon for 13,000,000 francs, receiving in part payment the Piedmontese national domains; but when these were reclaimed by the king of Sardinia, 1815, he received back some of the works of ancient art. After the overthrow of Napoleon, he separated from his wife, and broke off all connection with the Bonaparte family. He lost Guastalla, but retained the principalities of Sulmona and Rossano, his hereditary possessions.

The *Borghese Palace* is one of the most magnificent at Rome. The noble portico of the inner court is composed of 96 granite columns; the collection of paintings is remarkably fine.

BORGHESI, *bawr-gā′zē*, Bartolommeo, Count: 1781, July 11—1860; b. Savignano, central Italy: antiquary. His father, Pietro Borghesi, one of the most accomplished scholars of his time, trained him to an early delight in learned pursuits. He studied at Bologna, and afterward applied himself to archeological researches. He arranged the numismatic collection in Milan, and that of the Vatican, of which he drew up a catalogue. In 1821 he fixed his residence in the republic of San Marino, where he died. The French government undertook the publication of his works, of which 7 vols. appeared 1862–71. His principal work is his *Nuovi Frammenti Dei Fasti Consolari Capitolini Illustrati* (2 vols. Milan, 1818–20). His contributions to Forcellini's Latin Lexicon are very highly prized.

BORGIA, *bawr′jâ*, family originally Spanish, but which acquired great eminence in Italy after the elevation of Alfonso Borgia to the popedom, as Calixtus III., 1455 (d. 1458). He had previously been a privy-councilor of the king of Aragon.

Rodrigo B. ascended the papal throne 1492, Aug. under the name of Alexander VI. (q.v.). Before his elevation to the popedom, he had a number of children by a Roman woman named Vanozza (Giovanna de Catanei), of whom two were Cesare and Lucrezia.

Cesare or Cæser B., son of Rodrigo B., was one of the greatest monsters of a time of depravity, when the court of Rome was the scene of all the worst forms of crime. He unscrupulously made use of the most sacred things as means to the most iniquitous ends. He had early received high ecclesiastical preferment, and his father, soon after becoming pope, invested him with the purple. But his father conferring upon his brother Giovanni the Duchy of Benevento, with the counties of Terracina and Pontecorvo, Cæsar, as was believed, moved with envy, caused his brother to be assassinated. He obtained the duchy and counties for himself, and was permitted by his father to resign the purple and to devote himself to the profession of arms. He was sent, 1498, to France, to convey to Louis XII. a bill of divorce and dispensation from his marriage with Anne of Brittany. Louis rewarded him for the pope's complaisance with the Duchy of Valentinois,

a body-guard of 100 men, 20,000 livres of yearly revenue, and a promise of support in his schemes of ambition. In 1499, Cæsar married a daughter of the king of Navarre; and accompanied Louis XII. to Italy, where he undertook the conquest of the Romagna for the Holy See. The rightful lords of that country, who fell into his hands, were murdered, notwithstanding that their lives had been guaranteed by his oath. In 1501 he was named by his father Duke of Romagna. In the same year, he wrested the principality of Piombino from Jacopo d'Appiano, but failed in an attempt to acquire Bologna and Florence. He took Camerino, and caused Giulio di Varano, the lord of that town, to be strangled with his two sons. By treachery as much as by violence he made himself master of the Duchy of Urbino. A league of Italian princes was formed to resist him, but he kept them in awe by a body of Swiss troops, till he succeeded in winning some of them over by advantageous offers, employed them against the others, and then treacherously murdered them on the day of the victory, 1502, Dec. 31, at Sinigaglia. He now seized their possessions, and saw no obstacle in the way of his being made king of Romagna, of the March, and of Umbria, when, 1503, Aug. 17, his father died, probably of poison which he had prepared for twelve cardinals. Cæsar, who was a party to the design (and who, like his father, had long been familiar with that mode of dispatching those who stood in the way of his ambition, or whose wealth he desired to obtain), had himself partaken of the poison, and the consequence was a severe illness, at a time when the utmost activity and presence of mind were requisite for his affairs. Enemies rose against him on all hands, and one of the most inveterate of them ascended the papal throne as Julius II. Cæsar was arrested and conveyed to the Castle of Medina Del Campo, in Spain, where he lay imprisoned for two years. At length he contrived to make his escape to the king of Navarre, whom he accompanied in the war against Castile, and was killed, 1507, March 12, by a missile from the Castle of Biano. With all his baseness and cruelty, B. was noticeably free from the vice of intemperance in drink. He loved and patronized learning, and possessed a remarkably ready and persuasive eloquence. Macchiavelli has delineated his character in his *Principe*.

Lucrezia B. was a woman of great beauty. She was married first to Giovanni Sforza, Lord of Pesaro, but this marriage was dissolved by the pope. She next married, 1498, Alfonso, Duke of Bisceglie, natural son of Alfonso II. of Naples; but he was assassinated by her brother Cæsar 1501. In 1501, Sep., she married Alphonso of Este, who afterward inherited the duchy of Ferrara. She died 1520. She has doubtless suffered in repute from association with her father and brother, and has been charged with the most detestable crimes, such as incest; but it is now conceded that for such charges there is no proof whatever. She was a patroness of art and learning. See Gregorovius, *Lucrezia B.* (1874).

BORGNE, *bŏrñ*, [F.]: a person having but one eye, or who sees with one only. In surgery and anatomy, the word is sometimes used figuratively for blind.

BORGNE, *bawr'nė* LAKE: properly not a lake, but rather a bay or sound, in the s.e. of Louisiana, about 12 m. e. of New Orleans. It is connected with the Gulf of Mexico on the n.e., and communicates with Lake Pontchartrain at the n.w. by means of Rigolets Pass, which is about 10 m. long. The length of Lake Borgne is about 60 m.; breadth 15 to 25 m.

BOR'GO: name of a number of towns and villages in Italy and southern Tyrol; indicating the growth of the town or village around a castle or castellated rock, the original Borgo. See BOROUGH. Thus, *B. di val Sugāna* is a place of about 4,000 inhabitants, with a castellated hill, in Tyrol: *B. Lavezzaro* is an Italian town in the province of Novara, pop. about 3,000: *B. San Donino* (q.v.), etc.

BORGOGNONE, AMBROSIO (or IL BORGOGNONE): see FOSSANO, AMBROGIO STEFANIDA.

BORGOMANERO, *bawr-gō-mâ-nā'rō:* town of n. Italy, province of Novara, 19 m. n.n.w. from Novara; near the left bank of the Agonga. It is a walled town, well built, and contains a communal college and a hospital. It has little trade. Pop. 5,300.

BORGO SAN DONINO, *bawr'-gō sân dō-nē'nō:* city of Italy, province of Parma, 14 m. n.w. from Parma, on the railway between Parma and Piacenza. It is surrounded by walls, has several good streets, is an episcopal see, and has a cathedral (the oldest part of which is in the Lombard style), several churches, and several educational institutions. Manufactures of silken, linen, and woolen fabrics are carried on; and oil and wine are produced in considerable quantities. The city derives its name from a saint, said to have been a soldier in the army of the Emperor Maximilian, and to have suffered martyrdom here. The shrine of St. Donino has long been one of the most frequented in Italy. There are some curious remains of very rude mediæval sculpture in the cathedral. Pop. about 4,500.

BORGOTARO, *bawr gō tâ'rō*, town of n. Italy, province of Parma, 35 m. s.w. from Parma, on the left bank of the Taro, a tributary of the Po. It is encircled by walls, and is well built. The surrounding district is hilly and wooded. Pop. of commune, 7,000; of town, 2,200.

BORGU, *bawr gô'*, or BARBA: a district of Africa, in the Soudan, between 17°–20° n. lat. and 18°–21° e. long. It is partly mountainous, and partly a plain of drifting sand, with here and there limestone valleys, some of which are irrigated and occupied by nomadic tribes of Arabs.

BORIC ACID: see BORACIC ACID.

BORICKITE, *bōr'ĭk-īt* [from *Boricky*, who analyzed it]: a reddish-brown opaque mineral of waxy luster, occurring reniform and massive. It contains phosphoric

acid, 19.35–29.49; sesquioxide of iron, 52.29–52.99; water, 19.06–19.96; lime, 7.29–8.16; and magnesia, 0.—0.41. It occurs in Styria and Bohemia.

BORIDE, n. *bō′rīd;* a compound of boron (q.v.) with an element.

BORILLA, n. *bawr′ĭl-la* [etymology doubtful]: a rich copper ore in dust.

BORING: process in carpentry and in the working of metals; performed in a variety of ways. For boring holes in wood the carpenter makes use of *awls,* which simply displace a portion of the wood, and of *gimlets, augers,* and *bits* of various kinds, these last being applied by means of the crank-shaped instrument called a *brace.* The boring of holes in metal plates for making attachments, is effected by means of *drills* driven by machinery. The drill is inserted in the end of a vertical spindle, which revolves in a fixed frame, and is driven by the bevel-wheels. The metal to be bored is placed on a table or other support below the drill; and the up and down motion, or end-pressure and off-action, of the drill is effected by the hand-gear turning the screw which being coupled to the top of the spindle, presses it down or raises it, according to the way it is turned. The spindle slides vertically in the collar forming the axis of the bevel-wheel, but is carried round with it by means of a pin which projects into a groove.

For the Boring of Cannon and of Cylinders for steam-engines, see CANNON-FOUNDING: LATHE.

BOR′ING: process of perforation of earth and rocks. It comprises two operations—boring of shot-holes for Blasting (q.v.); and sinking of bores, either for drainage or in prospecting for minerals; also in forming wells for water, petroleum, salt-brine, etc. Blast-holes are made 1–2 in. or more in diameter. When they are to be made in hard rock by the simplest method, a steel-pointed drill is struck by a hammer, and after each blow is turned partly around to make the bore cylindrical; water poured into the bore from time to time facilitates the process of cutting, and preserves the temper of the drilling-tool. When many blast-holes are to be made, machinery supersedes hand-work. Usually the machine drill imitates the action of the hand-drill, the cutting being done by percussion, and the chisel partly rotated after each cut. The machine drill was first employed in boring the Mt. Cenis tunnel. The Burleigh rock drill, an American invention, is reputed to be one of the most efficient of machine-drills. It was used in the Hoosac tunnel from 1869 to the completion of the work. The rock to be perforated was gneiss alternating with quartz. In diamond-pointed drills the perforation is effected by pressing the tool against the rock and rotating it steadily, instead of making it cut into the rock by percussion. Brandt's rotatory borer is operated on the same principle as the diamond drill, but it has a crown of hardened steel instead of cutting diamond. When the rock to be perforated is of uniform structure, e.g.,

slate, an apparatus like the carpenter's brace and bit is used with advantage.

In prospecting for minerals and in sinking Artesian Wells (q.v.), the operations are performed either with boring rods or with rope-bores, or with diamond drills. In boring rods, the tools for cutting the rock and removing the *detritus* are fixed to rods which are lengthened as the bore increases in depth, and which are worked by hand or by machinery overhead. Soft ground can be perforated by tools like augers; but percussion is necessary where the ground is harder. When the depth is small the rods are lifted by hand, then allowed to drop, and partly rotated at each lift. For deep holes, and especially those of large diameter, steam machinery is employed to work the rod. The method of boring with the rope appears to have been used first in China. In this method the cutting tool is fastened to a rope, by which it is alternately raised and made to descend. In the diamond drill the working part is the 'crown,' a short piece of tube of cast steel, at one end of which a number of black diamonds are fastened into small cavities; the crown is screwed on the wrought-iron pipes, which constitute the boring-rod. Machinery at the surface causes the rod to rotate, and the result is the cutting of an annular groove at the bottom of the hole, leaving a core, which, breaking off from time to time, is caught by a little shoulder and brought to the surface with the rod. In places where it is not necessary to preserve this core for verification of the rocks passed through, the crown bears diamonds in the centre also: in either case the *detritus* is washed away by the stream of water which is forced down the tube and flows up the sides. With this system a bore-hole can be deepened continuously at a speed unattainable by other methods, which require stoppages for cleaning out the bore. The diamond drill used for prospecting in the Lake Superior region can be used above or below ground. Two inclined cylinders drive a horizontal crank shaft, which works bevel gear, causing the drill to revolve. At the same time a countershaft is likewise set in operation, and this effects the advance of the drill by gearing driving the feed-screw: as there are three kinds of gearing, the speed can be varied at pleasure. The feed-screw and its connections are carried by a swivel-head, and this can be turned to drill holes at an angle. The rods are lap-welded iron tubes $1\frac{5}{8}$ in. in diameter, fitted with a bayonet joint.

BORING ANIMALS: see BORER.

BORISSOGLIEBSK, *bo-rĭs-o-glĕbsk:* city of Russia, cap. of the district of the same name, on the Worona river, near its confluence with the Khoper, about 100 m. s.s.e. of Tambova. Being connected by railroads and by navigable streams with business centres in all directions, it has become a prosperous emporium. Pop. 25,000.

BORISSOV, *bō-rē'sof*, Russia, a town in the government of Minsk, 50 miles northeast of the town of that name, on the left bank of the Berezina. Not far from it took place

the disastrous passage of the Berezina by the French in 1812. Pop. about 15,000.

BÖRJESON, *bĕr'yĕ-sŏn*, JOHAN HELENUS LAURENTIUS, Swedish sculptor: b. Halland, 1835. He studied at Rome and Paris, and in 1879 became professor at the Art Academy of Stockholm. His work includes both portrait-statues and ideal subjects, in which he unites fidelity to nature with love of beauty. Among his works are *The Bowler; The Fisher Boy of Capri; Youth with a Tortoise;* and the statues of the poet Holberg at Bergen, of the historian Geiger at Upsala, of Axel Oxenstiern at Stockholm, and of King Charles X. Gustavus at Malmö.

BORLAND, SOLON, American senator: b. Virginia; d. Texas 1864, Jan. 31. He was educated in North Carolina, studied medicine and settled in Little Rock, Ark. During the Mexican war he served as major in Yell's cavalry, and was taken prisoner in 1847, January. After his discharge in 1847, June, he served as a volunteer aid to Gen. Worth until the end of the campaign. After serving in the United States Senate (1848–53), he was appointed minister to Central America. When returning to the United States after his resignation he was assaulted at San Juan de Nicaragua for interfering to prevent the arrest of a person charged with murder at Puntas Arenas. For this insult the sloop-of-war Cyane bombarded and destroyed the town, under instructions from the United States government, 1854, July 13. During the Civil War he was a brigadier in the Confederate service, and before his State seceded, raised troops and seized Fort Smith, by order of Gov. Rector 1861, April 24.

BORLASE, *bor'las*, WILLIAM: 1696, Feb. 2—1772, Aug. 31; b. Pendeen, Cornwall: English antiquary. Ordained a priest in the English Church 1720, he was, 1732, presented to the vicarage of his native parish of St. Just. Applying himself to study of the natural history and antiquities of Cornwall, he in 1753 published, at the Oxford press, a vol. entitled *Observations on the Antiquities, Historical and Monumental, of the County of Cornwall.* This was followed, 1758, by the *Natural History of Cornwall*, Oxford. B. paraphrased the book of Job, and wrote several pieces of a religious nature, was active in the supervision of his parish, and took an especial interest in the improvement of its highways. He was one of Pope's correspondents, and furnished to the poet most of the curious fossils of which the Twickenham grotto was composed.

BORMANN, *bawr'mân*, EDWIN, German poet: b. Leipsic, 1851, April 14. He was educated at the Polytechnic Institute of Dresden, and at Leipsic and Bonn. His first success was won by a series of humorous poems in the Saxon dialect which appeared in the *Fliegende Blätter.* His other works are in High German; they include *Seid umschlungen, Millionen*, a book of humorous songs, *Schelmenlieder; Das Büchlein von der Schwarzen Kunst; Liederhort in Sang und Klang;* and *Klinginsland, Minnelieder und Spielmannsweisen.*

BORMIO, *bawr'mē-ō* (Ger. WORMS, voormz), Italy, a town in Lombardy, near the Adda; pop. about 2,000. In its vicinity are the salt baths called Bagni di Bormio. The temperature is 99° 5′. Gen. Dessolles achieved here a victory over the Austrians, 26 March 1799. The beautiful galleries of the road which leads over the Wormser Joch (an Alpine mountain), from Tyrol to Italy, were destroyed by the Italians in 1848.

BORN, pp. *bawrn:* see BEAR, to bring forth. BORN AGAIN, having received spiritual life.

BORN, *bawrn*, BERTRAND DE: 1145?–1210? b. Perigord: French warrior and troubadour, prominent in the political and the literary history of his time. He defeated his brother in a contest for the family heritage. Richard the Lion-hearted sided with the brother; because he himself had been offended by certain of B.'s satirical songs. Thereupon B. favored Henry II. of England in the bitter quarrel between the king and his sons. Dante, in his *Inferno*, represents B. as among the damned, with his head cut off, and carrying it in his hand like a lantern.

His son BERTRAND DE BORN, poet and warrior like the father, is often confounded with him. It is supposed that he was killed in the battle of Bouvines (1214).

BORN, IGNATIUS, Baron VON: 1742–91; b. Karlsburg, Transylvania: mineralogist and metallurgist. B. was educated a Jesuit at Vienna, but soon left the order, and studied law at Prague. After travelling he returned to Prague, studied mineralogy, and 1770 was received into the dept. of mines and the mint. Against opposition, he introduced amalgamation in Hungary, in place of smelting and cupellation, for extracting silver from ores, and was rewarded by the emperor. He was appointed by Maria Theresa, 1766, to arrange the imperial museum at Vienna, where he soon became councilor of state. B. was active in Hungarian politics, and was one to receive the rights of denizen from the diet of the Hungarian states. His works on mineralogy were of much importance at the time.

BORNE, pp. *bōrn* [see BEAR, to carry]: carried; defrayed as to expense.

BÖRNE: see BOERNE.

BORNEENE, *bawr'nēn*, or FLUID BORNEO CAMPHOR, or OIL OF CAMPHOR: a thin liquid, lighter than water, with a fragrant odor (somewhat resembling turpentine); obtained by distilling native oil of Borneo camphor, or oil of valerian. The B. is employed in perfumery.

BORNEO, *bawr'nē-ō* (called by the natives *Pulo Kalamantin* or *Klemantin*, the name of an indigenous fruit): next to Australia and Papua, the largest island in the world; in the Indian archipelago, in 7° n.—4° 20′ s. lat., and 106° 40′—116° 46′ e. long. It is bounded on the e. by the Sea of Celebes and the Macassar Strait, s. by the Sea of Java, w. and n. by the Gulf of Siam and the China Sea. Its length is about 800 m., with a breadth of 700; about

283,358 sq. m.; estimated pop. 1,846,000. The largest part, on the s., e., and w., 203,714 sq. m. estimated pop. about 1.000,000, is a possession of Holland. On the n.w. coast is the state of Sarawak, pop. 300,000, under British influence and ruled by an English rajah. Northeast of Sarawak is the native state of Brunei, or B. proper, since 1890 under Brit. protection, pop. 50,000. Beyond Brunei is Brit. North B.. the property of an English trading co., and since 1888 under Brit. protection, pop. 150,000. Between Brit. North B. and the Dutch possessions on the e. is the native state of Sulu. Of the remainder of the island, which comprises the interior, little is known. The soil of the peopled and explored part is very fertile and adapted to cultivation of all tropical productions. There is abundance of valuable timber, and the island has a rich fauna. The principal minerals, so far found, comprise gold, coal, iron, diamonds, quicksilver, and antimony. The various states have considerable trade; exports including sago, bees-wax, camphor, spices, drugs, dyes, gold, coal, antimony, hides, rattans, indigo, tortoise-shell, cinnabar, trepang, gutta-percha, arrow-root, etc. Many varieties of fruit, spices, and gums, are either indigenous to the soil or are exceedingly thrifty in it. Malays, Dyaks, Kyans, Negritos, Bugis, and Chinese are represented in the pop. of the settled parts, and the Kanowits, Pakatans, and various tattooed races inhabit the interior. The principal Dutch settlements are at Sambas, Pontianak (q.v.), Banjermassin, and Koti.—The coasts of B. have numerous small bays and creeks, but no deep indentations, are mostly low and marshy, with occasionally dangerous islets and rocks. Two nearly parallel ranges of mountains extend s.w. n.e. through the island, one terminating on the n.e. coast at Mount Kini Balu, 13,698 ft. above sea-level. Between them are well-watered plains. The principal water courses, of which there are many fine ones, have outlets on the n. and w. coasts, and comparatively unknown upper courses. They are the Brunei, or Borneo, Redjang, Baram, Bintulu, Sirabas, Batang-Luper, and Sarawak, on the n.; the Kutei, Bulungan, and Kuran on the e.; the Barito, Kahaijan, Kapuas-Murung, Mendawei, and Sampit, in the s.e.; and the Pontiana, Sambas, Simpang, Succadana, and Pawan, on the w. The Brunei alone is navigable for vessels of considerable size. The great lake of Kinabalu, which figured in older accounts with 100 miles of circumference, is a pure myth, based perhaps on a misunderstood description of the great grass-covered plain of Danao. The climate in the low grounds is humid, hot, and unhealthful for Europeans; but in the higher parts, toward the n., the temperature is generally moderate, the thermometer at noon ranging 81°—91° F. —The forests produce iron-wood, teak, gutta-percha, ebony, sandal-wood, rattans, dye-woods, benzoin, wax, dragon's blood, sago, various resins, vegetable oils, and gums. The camphor is the best in Asia. The Mohor tree, well adapted for making native boats, attains a height of 80

ft., and the Kaladang, suited for large masts, 200 ft. Nutmegs, cloves, cinnamon, pepper, betel, ginger, rice, millet, sweet potatoes, yams, cotton, sugar-cane, indigo, tobacco, coffee, melons, citrons, pineapples, bananas, cocoanuts, etc. are largely grown. The mountains and forests contain many monkeys, including the orang-outang; the elephant is found on the n. coast, and the rhinoceros on the n.w.; domesticated animals are buffaloes, sheep, goats, dogs, and cats. The birds are remarkable for their plumage. The principal are eagles, vultures, Argus-pheasants, peacocks, flamingoes, pigeons, parrots, and the swallows (*Collocalia esculenta*) which construct the edible nests prized by the Chinese for making soup. The rivers, lakes, and lagoons swarm with crocodiles, and many kinds of snakes, frogs, lizards, and leeches. Fish is plentiful, and the coasts are rich in tortoises, pearl-mussels, oysters, and bêche-de-mer or trepang. Brilliant butterflies and moths are in great variety, and silk worms are found. The diamond mines are chiefly in Landak and Pontianak (q.v.); Sambas produces the greatest quantity of gold; Brunei, Kutei, and Banjermassin the largest amount of coal. The Dyaks, supposed to be the original inhabitants, and almost all heathen, live chiefly in the interior, and employ themselves with land culture, collecting gutta-percha, resin, gums, rattans, gold-dust, and wax. They are divided into numerous tribes. The Malays dwell on the coast, are traders and bold sailors. They are more civilized than the Dyaks, cultivate the grounds around their houses, lay out gardens, keep cattle, and live partly by fishing. The Chinese, chiefly from Canton, have penetrated far into the interior. They engage in trade and mining, are unwearied in their efforts to make money and then return to their native country. They have always endeavored to live as an independent republic, under chiefs chosen by themselves, and according to Chinese laws. In 1857 the Chinese living in Sarawak (q.v.) rebelled against Sir James Brooke (q.v.), and were nearly exterminated. Subsequently the Dutch were also compelled to put them down by force of arms, and have imposed a polltax.—The Portuguese discovered B. 1521 and settled at Banjermassin 1690; the Dutch, under a treaty, erected a fort and factory there 1643, and one at Pontianak 1778; and the British, after futile attempts to make a settlement in B. 1702 and 74, gained their first success there through the enterprise of Sir James Brooke 1838.

Dutch Possessions and Protectorate.—By far the largest part of the island is ruled, directly or indirectly, by the Dutch, who have divided it into the Residency of the western division of B., and that of the southern and eastern—the former having Pontianak (q.v.), as a seat of govt., the latter Banjermassin. The smaller portion toward the n. and n.e. contains Sarawak and the territories of the sultan of B. proper. Chief towns are Sambas (pop. 10,000), Pontianak (9,000) Banjermassin (30,000), Borneo or Brunei (20,000), Sarawak (25,000), and Kuching (12,000). Besides

a number of small dependencies, the Netherlands resident at Pontianak governs the important kingdoms of Landak, Mampawa, and Sambas, with the mining district of Montrado, in the n.; Tayang, Simpang, and Matan or Succadana, to the s.; and Sangouw, Sekadouw, and Sintang, in the interior. An assist. resident administers in the s.e. division of Dutch B. The produce consists of diamonds, gold, coal, tin, iron, wax, edible nests, pepper, gutta-percha, etc. There are many gold mines in Montrado and other districts; rich iron ores in Matan; gold, platina, copper, etc., in Sambas; and in former times Landak was rich in diamonds, but the product is now small. In this district was found the famed diamond of the sultan of Matan, which weighed 367 carats. The other Netherlands possessions in Borneo are called the Residency of the s. and e. division, including the lands from Matan, in the s.w., along the s. and e. coasts to 0° 50′ n. lat. The resident's house is at Banjermassin, on the island of Tatas, 15 m. from the mouth of the Banjar, 3° 34′ 40″ s. lat., and 114° 30′ e. long. Exports are pepper, diamonds, gold dust, coal, benzoin, wax, rattans, dragon's-blood, camphor, edible nests, iron, firearms, etc. Imports—piece-goods, powder, knives, opium, rice, salt, sugar, Chinese porcelain, silk stuffs, coral, pearls, etc. On the e. coast there is coal, and the sultan of Kutei delivers it according to contract, for the use of the Dutch navy, at about $5 per ton. At Nagara (pop. 10,000) in Banjermassin, are important factories of firearms and other weapons. In 1860 the direct govt. of Banjermassin was assumed by the resident, but the interior of the kingdom has always been disturbed, especially in 1873, through the war with Atcheen (q.v.) inciting the Mohammedan population against the Dutch.

BOR′NEOL, or Borneo Camphor, a crystalline organic compound, often used as a substitute for common or laurel camphor. Borneol is obtained from a tree indigenous to Sumatra, Borneo, and Labuan, being deposited in crystals in cracks in the wood. To obtain it the tree is cut down, and the longitudinal fissures are opened, and the camphor removed. Large trees often yield only from 3 to 11 pounds; and owing to the reckless manner in which the trees have been destroyed without the planting of others, the Sumatran forests now contain few that are worth working. Borneol has the chemical formula $C_{10}H_{17}$. OH, and it may be prepared from common camphor by the action of reducing agents. It is not so volatile as common camphor, and is also harder. It is but slightly soluble in water, although it dissolves freely in alcohol and ether. When distilled with phosphorous pentoxide, borneol is converted into one or more terpenes, prominent among which is borneo-camphene or borneëne ($C_{10}H_{16}$). Pure borneol sinks in water, while common camphor floats.

BORNHOLM, *bŏrn′hōlm:* island in the Baltic Sea belonging to Denmark, about 90 m. e. of Seeland; area, with three small islands near, about 230 sq. m. It is rocky, and the most notable product is porcelain clay. The capital is

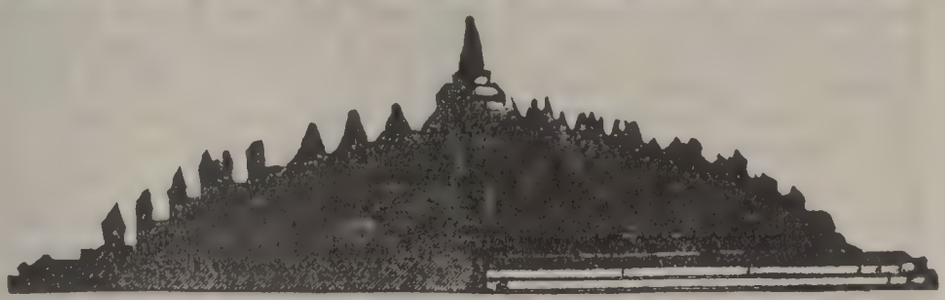
Rönne, or Rottun, on the w. coast (pop. 7,000.) Pop. of the island, above 35,000.

BORNING, or BONING [from Fr. *borner*, to bound]: process used by masons, surveyors, and gardeners in judging of the straightness or level of any surface or line by simply looking along two or more borning-pieces or boning-rods set up for the purpose.—The gardener's boning piece consists of a slip of board, about 18 in. long, fastened by its middle at right angles to one end of another slip 4 ft. long.

BORNU, *bawr'nô*, a state of Central Africa between lat. 10° and 15° n., and long. 12° and 18° e.; bounded on the e. by lake Tchad, s. by Mandara, w. by Hausa, and n. by Kanem and the Sahara. The greater part of the country is perfectly level, and much of it is liable to be overflowed in the rainy season, which lasts from Oct. to Apr., when fevers and other diseases consequently prevail. The heat from March to June is excessive, ranging from 104 to 107° F. The two principal rivers are the Shari and the Yaobe, or Yo, both of which fall into Lake Techad. The soil is fertile, and, although the cultivation is very imperfect, produces plentiful crops of maize, millet, barley, rice, various kinds of pulse, cotton, and indigo. The inhabitants possess elephants, horses, buffalos, oxen, sheep, etc. Wild beasts, as lions, panthers, etc., are very numerous, having their chief haunts in the forests which occur only in the vicinity of the rivers, and which abound also in birds of many kinds, snakes, crocodiles, etc. Wild bees are extremely plentiful. The country produces no iron, that which is used being brought from Mandara. The only manufacture carried to any considerable extent is that of cotton cloth, which is dyed with beautiful blue stripes by means of indigo, and much exported to Fezzan. The population, which is estimated at about 5,000,000 is mostly of the negro race, and called Kanowry. The ruling race, called Shuwas, are of Arab descent, and bigoted Mohammedans; but many traces of Fetishism remain among the masses. Whatever they have of civilization they derive from the Arabs. The slave trade is eagerly prosecuted, and gives occasion to many warlike expeditions. B. appears to have existed as a state for many centuries, but in the beginning of the present c. it was conquered by the Fellatahs, whose yoke, however, was soon shaken off under the leadership of a fanatic fakir named Mohammed el Amin, whose services were called in by the sultan. On Mohammed's death, his son Omar became ruler of B. instead of the sultan.

BORO BUDDOR, *bō'rō bô dawr'* (the Great Buddah): the ruin of a splendid Buddhist temple in Java, residency Kadu, regency Magelang, and dist. Minoreh, near the junction of the Ello and Progo; the most elaborate monument of the Buddhist style of architecture anywhere existing. Buddhism (q.v.) was early introduced into Java, and Javanese chronicles place the building of B. B. in the beginning of the 7th c. It is a pyramid of a square form, each side at the base measuring 600 ft., and consists

of seven walls, built like the steps of a stair up a hill. Between the walls are narrow terraces running round the building. The walls are richly ornamented with statuary. Outside are niches, each occupied by a statue of Buddha, larger than life, seated in the usual attitude, with his legs crossed under the body. The number of these figures is about 400. Between each of these are bas-reliefs, representing the god in the same attitude, besides architectural ornaments and carvings of all sorts. Below the niches, on the lower story, is an immense bas-relief running round the whole building, representing scenes from the life of Buddha, and religious subjects. The inner faces of the building are also profusely ornamented with bas-reliefs, seated figures and architectural ornaments, to an extent un-



Elevation and Section of Temple of Boro Buddor.

rivalled by any other building in the world. The art of sculpture appears in Java to have early attained a very high development. Above and within the upper square terrace are three circular ones, the outer ornamented with 32, the next with 24, and the upper with 16 small domes, each containing a seated statue of Buddha, which can be seen through the open work of their roofs. The whole is surmounted by what must be considered as the Pagoda (q.v.) itself, now empty, its centre occupied only by a sunken chamber 10 ft. deep, meant originally, no doubt, to contain the relic for which this splendid temple was erected.

BORODINO, *bŏ rō dē′nō*, village of Russia, govt. of Moskwa, about 70 m. w. from the city of Moscow. It is on the Kalouga, an affluent of the Moskwa, and gave name to the great battle fought between the French army under Napoleon, and the Russian under Kutusow, Barclay de Tolly and Bagration, 1812, Sep. 7. This battle was one of the most obstinately disputed in history, and the loss on both sides was almost equally great. Out of 240,000 men engaged, between 70,000 and 80,000 were killed and wounded. The Russians retreated on the following day, but in perfect order, and without the enemy venturing to attack them. The Russians, therefore, have always held this battle as a victory, and in 1839 raised a fine mausoleum on the battlefield. To the French, however, certainly belongs the honor, as they not only remained on the field of battle, but in seven days after had pushed on to Moscow. The French name it the battle of the Moskwa, from the river of that name, and it gave Marshal Ney his title of Prince of Moskwa.

BORON, n. *bō′rŏn* [from the root *bor* in *borax*]: in *chem.*, a non-metal, or a metalloid, one of the elementary substances, the base of boracic acid. BORURET, n. *bŏr′ur-ĕt′*, a combination of boron with a simple body. BORON ACID, same as *boracic acid.*

BO′RON (symb. B. at. wt. 11): non-metallic element present in Boracic Acid (q.v.) and Borax (q.v.). It was discovered 1808 by Gay-Lussac in France, and Davy in England. The process followed in procuring B. till lately, was to mix pure and dry boric oxide (B_2O_3) with thin slices of the metal potassium (K), and heat them in a tube, when six atoms of the potassium abstracted the oxygen, forming potassium oxide (K_2O), and set free the boron (B.). On cooling and washing the mixture with cold water, the potassium oxide dissolved out and left the B. as a dark greenish-brown powder, which, when heated, burned with a green flame, and was re-formed into boric oxide by combining with the oxygen of the air. This *amorphous boron* is now obtained by heating boric anhydride with sodium. A crystalline form (Wöhler and Deville having discovered the method) is obtained by heating to a high temperature with aluminium, when B. is left as minute crystals interspersed through the earth alumina. These crystals possess great interest from their similarity in properties to pure crystallized carbon, or the diamond, and they are now known among scientific chemists as *B. diamonds.* They are remarkably transparent, are tinged yellow or red (though the colors may be accidental), and rival the ordinary diamond in their lustre and refractive power. B. diamonds not only scratch glass, but scratch also the corundum and sapphire; and a real diamond, with which a few B. diamonds were crushed, had its edges worn away. It is apparent, therefore, that the B. crystals possess in a high degree the characters of the ordinary diamond; and though they have as yet been obtained only in minute specks, yet it is not too much to expect that the size will be increased, and the artificial B. diamond come into market as an article of ornament, to rival the *natural* carbon diamond in its mysterious power of flashing back the rays of light. Indeed, so like are these two kinds of diamonds, that they can scarcely be distinguished by outward characters or signs; and it has been gravely suggested that some of the diamonds which now adorn the brow, the neck, or the arm, may be natural B. diamonds. They are very indestructible, requiring a high temperature to destroy them: B. forms but one oxide, boric oxide (or anhydride), B_2O_3.

BORONIA, n. *bŏ-rō′nĭ-a* [after *Borone*, an Italian]: a genus of plants, ord. *Rutācĕæ*, many cultivated as elegant hot-house shrubs: *B. mĕgăstĭa′ mă* [Gr. *mĕgas*, great, and *stigma*]: a favorite species with twiggy branches, and copious axillary flowers which have a delicious aromatic fragrance.

BOROUGH, n. *bŭr′ō* [AS. *burh* or *burg*, a city: Icel. *borg;* It. *borgo;* F. *bourg*, a town—from Goth. *bairgan;*

AS. *beorgan*, to protect: mid. L. *burgus*, a small fortified place, a collection of houses: compare Gael. *buar-ach*, an inclosure for cattle—from *buar*, cattle]: formerly a collection of houses inclosed or fortified by a wall, or protected by a *burg* or castle; a corporate town; a town which sends a burgess to parliament. BOROUGHMONGER, n. [see MONGER]: one who traffics in the patronage of parliamentary boroughs.—*Borough* is a term of varying application; in general a corporate town or any organized municipality, but in some localities a cluster or close collection of houses. It seems to have meant first a hill, or heap of earth; and it was probably from the elevated positions on which places of defense were erected, that it came to signify a fortification or castle, and latterly the aggregate of houses, churches and other structures, which, in unsettled times, usually gathered under the walls of a castle; together with their inhabitants, and the arrangements for their government. The questions whether municipal corporations are due to Roman, or to Saxon and other Teutonic influences, or to both; and if to both, then to what extent to each, have been keenly discussed by constitutional historians. But from whatever source derived, that the boroughs of England existed, not as aggregates of houses merely, but as corporate bodies, in the Saxon time, is now generally admitted. As their support came to be needed by the governing factions they were given representation in Parliament; and under the Tudors, especially Mary, small boroughs in great profusion were created expressly to return members in the government interest. This was stopped under Elizabeth. Besides these the older boroughs decayed till they had little or no population, but were allowed to keep their parliamentary power to strengthen the aristocratic and landowning interest, the proprietors of the sites returning whom they chose: these were called 'rotten boroughs'. The Reform Bill of 1832 swept away the worst of these anomalies. The B. system of Scotland is also of great antiquity.

In the United States the term is now restricted to certain incorporated villages below the rank of cities in four States—Connecticut, New Jersey, Minnesota, and Pennsylvania; and is practically synonymous with 'town' in most other States, and with 'village' in Ohio. At the beginning of colonization the natural idea was to transplant the English borough system to America; but the conditions of settlement and government made it generally inapplicable. After the Revolution, however, the Pennsylvania legislature granted special borough charters freely, and in 1834 passed an act empowering courts of quarter sessions to grant them; in 1851 a general act for their creation and regulation was passed. In New Jersey they were created by special charters as early as the beginning of the 18th century, and in 1818 a general act was passed. In Connecticut they have always been created by the legislature, in special acts. In Minnesota and

Pennsylvania the boundaries of the borough are conterminous with the township, forming one of the primary county divisions: in Connecticut and New Jersey the borough is only a village government within a town, which in all cases is a separate body including the borough; the latter being only the thickly settled portion and governed by a warden and burgesses, corresponding to the mayor and single-chamber council of a city.

A still further extension was given to the term by the New York legislature in 1897, when the city of Greater New York was constituted of five 'boroughs'—Manhattan, Brooklyn, Queens, The Bronx, and Richmond.

BOROUGHBRIDGE, *bŭr'ō-brĭj:* town in West Riding, Yorkshire, on the right bank of the Ure, here navigable for small craft, 20 m. n.w. of York. It arose simultaneously with the decline of Aldborough, 1½ m. to the e., soon after the Conquest, when the great north road was diverted from Aldborough to this place. Its chief trade is in agricultural produce and hardware. Edward II., 1321, defeated the Earl of Lancaster here. Near B. are three immense Druid stones, called the 'Devil's Arrows,' 16 to 22 ft. high. Pop. of B. 966.

BOROUGH ENGLISH: custom in some ancient boroughs in England, according to which the youngest son inherits the property within borough in preference to his elder brothers. See CUSTOM: GAVELKIND: INHERITANCE.

BOROUGH FUND: certain rents, profits, dividends, interest, etc., payable to certain bodies corporate connected with a borough, required in English law to be paid to the treasurer of the borough. See FUND: CORPORATION: MUNICIPALITY.

BOROUGH JUSTICES: first created in the time of Charles I.: see JUSTICES.

BOROUGH LAWS: in Scottish legal history, ancient laws relative to boroughs or *burghs*, which have long ceased to have force, but throw light on the ancient manners and customs of the country. The authenticity of these B. L. is beyond question; they are universally allowed to have been enacted in the reign of King David in the 12th c. See REGIAM MAJESTATEM.

BOROUGH RATE: in England, a rate levied within borough by order of the council of the same. It supplements any deficiency of the Borough fund (q.v.).

BOROVITCHI, *bŏr-ō-vĭt'chē:* town of Russia, govt. of Novgorod, 98 m. e. of the town of Novgorod, on both sides of the river Msta, near some rapids. Its situation on the great canal and river water-way which connects the Volga with Lake Ladoga, gives it considerable commercial importance. Pop. 11,000.

BOROVSK, or BOROFSK, *bō-rŏvsk':* town of Russia, govt. of Kalouga, 49 m. n.n.e. of the town of Kalouga, jointly with which it gives title to a bishop. It has extensive manufactures of sail-cloth, and a trade in leather,

flax, and hemp. Its onions and garlic are celebrated, In its vicinity is a convent, founded 1444, one of the richest in the empire. Pop. 10,000.

BORRELISTS, n. *bŏr′rĕl-ĭsts* [from *Borrel*, the founder of the sect]: a Christian sect in Holland who reject the sacraments and other externals of Christian worship, combining this with austerity of life.

BORROMEAN ISLANDS, *bŏr-rō-mā′an:* group of small islands in the Lago Maggiore, n. Italy. They are in the western arm of the lake, called the Bay of Tosa, and are named after the family of Borromeo, which for centuries has been in possession of the richest estates in the neighborhood. They are sometimes called also *Isole dei Conigli*, on account of the number of rabbits found on them. They were little more than naked rocks, till Vitaliano, Count Borromeo, master-general of ordnance to the king of Spain, about 1671, caused soil to be carried to them, built terraces, and converted them into gardens, the beauty of which and of their situation has won for them the name of the *Enchanted Islands*. The two most celebrated are *Isola Bella* and *Isola Madre*. On the w. side of *Isola Bella* stands a palace of the Borromeo family, containing many admirable paintings and other works of art. *Isola Madre* is laid out in the same terraced style, and is crowned by a castle. The odors of flowers from the islands, upon which grow many plants of tropical climates, are wafted far over the lake. The *Isola de' Pescatori* now contains a village of about 400 inhabitants.

BORROMEO, *bŏr-rō-mā′o*, CARLO, Count, Cardinal, Archbishop of Milan: saint of the Church of Rome: 1538, Oct. 2—1584, Nov. 3; b. at the Castle of Arona, on the Lago Maggiore, the family seat of his ancestors. He studied law at Pavia, and took the degree of doctor 1559. His uncle, Pope Pius IV., on being raised to the pontificate in 1560, appointed him to a number of high offices, notwithstanding his youth. B. showed great faithfulness and ability in governing Ancona, Bologna, and other parts of the States of the Church as legate, and in discharging the duties of offices connected with ecclesiastical administration at Rome. Surrounded with magnificence and luxury, he was always grave, pious, and rigid in his life, studious, and a patron of letters. His uncle, the pope, made him his grand penitentiary, and did nothing considerable without his cooperation. It was in a great measure by his influence that the re-opening of the Council of Trent was accomplished, and that its deliberations were brought to a conclusion so favorable to the papal throne. He committed its decrees to memory, had the principal part in drawing up the *Catechismus Romanus* for exposition of them, and proceeded to give all possible effect to them in his archiepiscopal province. B.'s exertions, not only for the improvement of ecclesiastical discipline, but also for the reformation of morals in the archbishopric of Milan, drew upon him the hostility of the monastic orders,

and also to some extent that of the Spanish authorities in Milan, who were jealous of the extension of his jurisdiction. An attempt was even made upon his life in 1569. He spent great part of his income in beautifying the cathedral and other churches. With a view to provide well-qualified priests, he founded, 1570, the Helvetic College at Milan. He brought about an alliance of the seven Rom. Catholic cantons, known as the *Golden Borromean League,* for the united defense of their faith. In the famine of 1570, and during the plague in Milan 1576, he showed equal energy, benevolence, and devotedness, saving the lives of multitudes by prompt arrangements for relief. He died, exhausted by labors and austerites. Many supposed miracles at his tomb led to his being canonized 1616. His theological works were published at Milan 1747, 5 vols. folio. On the w. bank of the Lago Maggiore, in the neighborhood of his birthplace, is a colossal brazen statue of him.

His brother's son, Count Frederico Borromeo, b. 1563, also was a cardinal, and 1595–1631 abp. of Milan, and was the founder of the Ambrosian Library (q.v.).

BORROW, v. *bawr′rō,* [AS, *borg* or *borh,* a surety, a loan— from AS. *beorgan,* to protect: Dut. *borg,* a pledge; Ger. *bürge,* a surety]: to obtain money on security; to solicit from another on loan; to receive on credit for a time; to imitate; to copy: N. in *Scot,* and *OE.,* 'a pledge.' Borrowing, imp. soliciting on loan: N. the act or practice of soliciting on loan. Bor′rowed, pp. *-rōd,* used as one's own which really belongs to another; assumed, as in manners, or dress, fictitious; copied. Bor′rower, n. *-ėr,* one who.

BORROW, *bŏr′rō,* George: 1803–1881, July 30; b. Norfolk: English author. From his earliest years he had extraordinary talent for languages, and strong inclination for adventure. In his youth he lived some time among gypsies, acquiring an exact knowledge of their language, manners, and customs. His travels as agent for the British and Foreign Bible Soc. through almost all countries of Europe and a part of Africa, made him familiar with many modern languages, even to their dialectic peculiarities. Whatever was little known had peculiar charms for him, and he shrunk from neither toil nor danger. True to his youthful predilection, he made the gypsies scattered over every part of Europe one of the principal subjects of his study. His first work, *The Zincali or an Account of the Gypsies in Spain* (2 vols. Lond. 1841), made a favorable impression by its lively and dramatic style. It was followed by *The Bible in Spain* (2 vols., Lond. 1843), a book to which chiefly its author is indebted for his celebrity, and which consists of a narrative of personal adventures, in which the graphic power of the style amply compensates for the rather unmethodical arrangement of the book. After a long interval, B. published a work long before announced, *Lavengro, the Scholar, the Gypsy,*

and the Priest (3 vols., Lond. 1851), generally regarded as an autobiography, with a spice of fancy mingling with fact. The principal character is depicted with extravagant exaggeration; and the somewhat bizarre originality which gave a peculiar zest to the author's earlier works here appears as mannerism. The book left the hero in the midst of his adventures, and was not continued until 1857, when B. published *The Romany Rye*, a sequel to *Lavengro*. He published *Wild Wales* 1862, and *Romano Lavo-Lil* 1874.

BOR'ROWING, in Law: soliciting and receiving on loan. In the case of *money*, several legal applications of a general nature, regarding *bonds*, *mortgages*, and other similar *securities*, have to be considered: see these titles. More strictly, borrowing may be described as a contract under the law of *bailments* (see CONTRACT), and may be briefly and simply defined as asking or taking a loan. The essentials of this contract are, that there must be a certain specific thing lent, such as a book, an article of furniture, a horse, or it may be a house, land, or even an incorporeal right. But in the law of England the contract is confined to goods and chattels or personal property, and does not extend to real estate. The borrowing must be gratuitous and for the borrower's use, which use must be the principal object, and not a mere accessory. Such use, too, may be for a limited time or for an indefinite period. The contract must be also of a legal nature, for if it is immoral, or against law, it is utterly void; this, however, is a necessary qualification of all contracts. Lastly, the property which is the subject of the contract must be borrowed or lent to be *specifically* returned to the lender at the determination of the agreement, in which respect it differs from a loan for consumption. The persons who may borrow and lend are all those who can legally make a contract. It is not necessary that the lender should be absolute proprietor of the thing lent or borrowed; it is sufficient if he have either a qualified or a special property therein, or a lawful possession thereof. As to the borrower, he has the right to use the thing during the time and for the purpose intended, whether such intention is expressed or implied; but beyond this he cannot go. During the period of the loan, the borrower has no property in the thing, but a mere right of possession and use of it. But notwithstanding, if the thing lent and borrowed be injured by a stranger, it would appear that the borrower may maintain an action for the recovery of damages; the mere possession of property without title being sufficient against a wrongdoer. See CONTRACT: LOAN: HIRE: and the titles above referred to.

BORROWING DAYS: name for the last three days of March, in Scotland and some parts of England. The popular notion is, that these days are borrowed or taken from April, and may be expected to consist of cold or

stormy weather. Although this notion dates from a period before the change of the style, a few days of broken and unpleasant weather about the end of March still afford a sanction for old notions concerning the borrowing days. The origin of the term B.D. is lost in the mists of antiquity, though the conjecture may be hazarded that it has no higher source than the popular rhyme in which it is introduced as a poetic fiction.

BORROWSTOUNNESS, *bawr′ro-stown-nĕs′*, or Bo'-NESS, *bō-nĕs′:* seaport in Linlithgowshire, Scot., on a low peninsula on the Firth of Forth, 17 m. w.n.w. of Edinburgh. It has coal-mines extending under the bed of the Firth; and manufactures of salt, soap, malt, vitroil, and earthenware, and a trade in grain. Ironstone, limestone, and freestone are in the parish bounds. Graham's Dike, a part of the Roman wall of Antoninus, traverses it. Extensive harbor improvements have increased the commerce. Coal and iron are the principal exports and Baltic timber the chief import. Pop. 9,100.

BORSAD: town in the n. division of the province of Bombay, district of Kaira. It is in the elevated region of Gujerat, 1,900 ft. above sea level, and is connected by railway with Bombay and Baroda. Pop. 13,000.

BORSIPPA, *bŏr-sĭp′pâ:* town of ancient Babylonia (now Koofa?), on the right bank of the Euphrates, about 8 m. s. of Hillah. Nebuchadnezzar inclosed B. within the walls of Babylon, and in cuneiform writings it is often mentioned in connection with that city. B. furnishes a celebrated Assyrian inscription, in cuneiform characters, now in the British Museum, London.

BORSOD, *bor-shod′:* county in Hungary, on both sides of the river Saja, tributary of the Theiss. It was named after the ancient castle of Borszod (now in ruins), and is one of the most fertile sections in the kingdom. It has copper, iron, and coal mines, and produces grain, excellent fruits, hemp, tobacco, and cheese. Cattle are extensively raised.

BORT, n. *bŏrt,* or BOORT, n. *bûrt:* a kind of impure diamond imported from Brazil, used for polishing other stones, and in the construction of the instruments for boring artesian wells.

BORY DE SAINT VINCENT, *bō-rē′ dĕh sănng-vang-sŏng′*, JEAN BAPTISTE GEORGE MARIE: 1780–1846, Dec. 22; b. Agen, now in the dept. of Lot-et-Garonne: French traveller and naturalist. In 1798, he went with Captain Baudin on a scientific mission to New Holland, but separated from him before they reached their destination. On his return he wrote his *Essai sur les Iles Fortunées de l'antique Atlantide* (Par. 1803); and his *Voyage dans les quatre principales Iles des Mers d'Afrique* (Par. 1804). Having joined the army, he served at Ulm and Austerlitz, and on Soult's staff in Spain. He served as a colonel at Waterloo, and afterward had to retire to Belgium. At Brussels he edited, with Van Mons, the *Annales des Sciences*

Physiques (8 vols.). He produced an admirable work on the subterranean quarries in the limestone hills near Maestricht (Par. 1821). He returned to France 1820, wrote for liberal journals, and for Courtin's *Encyclopédie*, etc. In 1827, appeared his *L'Homme, Essai Zoologique sur le Genre humain*. He wrote what relates to cryptogamic plants in Duperrey's *Voyage autour du Monde* (Par. 1828). He rendered an important service to science by editing the *Dictionnaire Classique de l'Histoire Naturelle*. When, 1829, the French goverment sent a scientific expedition to the Morea and the Cyclades, the first place in it was assigned to B. de S. V.; and the results of his researches were given to the world in the *Expédition Scientifique de Morée* (Par. and Strasb. 1832, etc.), and in the *Nouvelle Flore du Péloponnèse et des Cyclades* (Par. 1838). In 1839, he undertook the principal charge of the scientific commission which the French government sent to Algeria.

BORYS'THENES: see DNIEPER.

BORZNA, *bŏrz'nâ:* a town of Russia, govt. of Tchernigov, 50 m. s.e. of the town of Techrnigov. Pop. 8,000.

BOS: see BOVIDÆ: OX.

BOS, LAMBERT: 1670, Nov. 23—1717, Jan 6; b. at Workum, Friesland: Dutch philologist. He studied at the Univ. of Franeker, where, by the advice of Vitringa, he applied himself especially to the Greek language. In 1704, he was appointed Greek prof. in that univ. All his works are characterized by thorough scholarship and remarkable acuteness, and notwithstanding the advances of classical criticism since his day, some of them are still consulted, such as his *Vetus Testamentum ex Versione Septuaginta Interpretum* (Franeker, 1709; new ed., Oxford, 1805) his *Ellipses Græcæ* (Franeker, 1702), and particularly his *Antiquitatum Græcarum præcipue Atticarum Descriptio Brevis* (Franeker, 1714).

BOSA, *bō'sâ:* town of the island of Sardinia, province of Cagliari, near the mouth of the Termo; lat. 40° 17′ n., long. 8° 27′ e. Notwithstanding its fine situation, partly on the side of a hill, and partly on a plain, it is unhealthful. It is surrounded by decaying walls; has an old castle, a cathedral, several monasteries and churches; and a trade in wine, oil, grain, and coral. Its port admits vessels of small size. Pop. (1901) 6,346.

BOSCAGE, n. *bŏs'kāj* [OF. *boscage;* It. *bosco*, a wood]: underwood; a thicket; a landscape in which thickets are painted. BOSKET, or BOSQUET, n. *bŏs'kĕt*, a grove; a bower. BOS'KY, a. *-kĭ*, wooded; shady.

BOSCAN-ALMOGAVER, *bōs-kân'âl-mō-gâ-vär'*, JUAN: b. Barcelona, Spain, 1500; d. some time before 1544: poet. He was of an ancient noble family; received from his parents a careful education; and went to Granada, to the court of Charles V. The education of the celebrated Duke of Alva was afterward intrusted to him. He spent the latter part of his life at Barcelona, editing his own

works and those of his friend Garcilasso de la Vega. He was the first to make use of Italian measures in Spanish verse, and thus became the creator of the Spanish sonnet. By the introduction of various Italian forms, he made an epoch in Spanish poetry. His poems are still esteemed, but his other literary productions are forgotten. The best edition is that of Leon, 1549.

BOSCAWEN, *bos'ka-wen*, EDWARD: Admiral in the British navy: 1711–61; second son of Viscount Falmouth. He highly distinguished himself at the taking of Puerto-Bello, and at the siege of Carthagena, 1740. In 1744, Apr., he captured the French ship *Medée*, with 800 prisoners. He had an important share in the victory off Cape Finisterre (1747, May 3), and six months afterward received the command of the East Indian expedition; he showed high military skill in conducting the retreat from Pondicherry. He returned 1750, and in the following year became a lord of the admiralty. In 1755, he was again afloat, and intercepted the French fleet off Newfoundland, capturing two 64-gun ships and 1,500 men, including the French commander, Hoquart, whom he had twice before taken prisoner. Next year, as admiral of the blue, he was appointed commander-in-chief of the powerful expedition against Cape Breton, as the fruit of which that island and St. John's were taken after some hard fighting. B. crowned his career by his signal victory over the French Toulon fleet, in the Bay of Lagos, 1759, Aug. 18. On his return home, he received the thanks of parliament, a pension of £3,000 a year, a seat in the privy council, and the command of the marines. Lord Chatham is said to have testified that when he proposed expeditions to other commanders he heard only of difficulties, but when he applied to B., he found him ready with suggestions and expedients.

BOSCH, *bosk*, HIERONYMUS DE: 1740, Mar. 23—1811, June 1: b. Amsterdam: unquestionably the most distinguished Latin poet of recent times, and a philologist of varied acquirements. His *Poemata* first appeared at Leyden, 1803 (2d ed., Utr. 1808). He rendered an important service to classical literature by his edition of the *Anthologia Græca*, with a metrical translation by Hugo Grotius never before published (4 vols., Utr. 1795–1810 to which Van Lennep added a fifth vol., Utr. 1822). His Discourses and Treatises on subjects of literature, mostly in Dutch, show profound learning, excellent judgment, and refined taste.

BOSCH-BOK, *bŏsh'bŏk:* one of the s. African kinds of antelopes, inhabiting dense thickets. It is very shy, and is said to make a sound like a dog barking.

BOSCHISMEN, n. plu. *bŏsh'ĭs-mĕn* [Dut. *bosch*, a wood; *men*, a man]: a word used by Professor Owen for *Bushmen*, or *Bosjesmen*.

BOSCH-VARK, *bŏsh'vârk:* bush-hog of s. Africa: see HOG.

BOSCOBEL, *bŏs′kō-bĕl:* an extra-parochial liberty of England, in the county of Shropshire, about 6 m. e.n.e. of Shiffnal. The population of B. is only about 20, but the place is interesting in connection with the escape of Charles II. after his defeat at Worcester, 1651. After the battle, Boscobel House being proposed as a secure retreat, thither Charles turned his steps. At White-Ladies, a seat of the Giffard family, which was reached in the early morning, the king had his long hair cut, his hands and face smeared with soot; and for his royal dress he substituted the green and greasy suit of a countryman, and a leathern doublet. Thus disguised, Charles passed through a secret door into a neighboring wood, in the thickest part of which he sat shivering in the rain until dusk, when he stole out, and with a guide endeavored to reach Wales, where it was thought he would be safer than at Boscobel. They reached a royalist's house at Madeley, on the banks of the Severn, at midnight, and it was then found that they could not escape to Wales on account of the vigilance of the Puritans; and once more, after a day's rest in a stable loft, the king started for Boscobel wood, where he arrived about five o'clock in the morning. He immediately, with Major Carlis, who had led the forlorn-hope at Worcester, ascended a thick pollard oak, from which they could watch at intervals during the day the Roundheads in search of them passing by unaware of their near presence. In the evening, they descended, and made their way to the manor-house, where the king remained hidden two days. After other adventures Charles contrived to escape from England, Oct. 17.

Boscobel Tracts is the title of certain contemporaneous writings, first published 1662, giving a graphic description of this passage of the monarch's life. The authorship is generally attributed to Thomas Blount, a loyal gentleman of Worcestershire; but Nash, his grandson, in his history of Worcestershire, denies that they were his, on the authority of Blount himself.

BOSCO REALE, *bŏs′kō rā-âl′lā*: town of s. Italy, province of Naples, at the s. base of Mount Vesuvius, 10 m. e.s.e. of Naples city. It contains several churches and convents. Good wine is produced in the neighborhood, and much silk. This town was in imminent danger of destruction by the eruption of Vesuvius 1850, when a stream of lava advanced toward it with a front of about a mile and a half broad, and a depth of about 12 ft. enveloped the town, and consumed the wood on both sides of it, in which were many magnificent oak, ilex, and ash trees. Pop. 5,000.

BOSCO TRE-CASÉ, *bŏs′kō trā-kâ′sā*: town of Italy, at the s. base of Mount Vesuvius. It has several churches and convents, and a royal manufactory of arms and gunpowder. Wine and silk are raised in the district. Pop. 2,500.

BOSCOVICH, *bos′ko-vitch,* Roger Joseph: 1711, May

18—1787, Feb. 12; b. Ragusa, Austria: celebrated mathematician and astronomer. He entered at an early age into the order of the Jesuits, and spent his life in scientific pursuits and important public labors. Before the completion of his course of studies in Rome, he was appointed teacher of mathematics and philosophy in the *Collegium Romanum* there. The pope gave him a commission to measure a degree of the meridian in the States of the Church, which he accomplished 1750–53. In 1764 he was appointed to a professorship in Pavia, but after some time retired from this office. He was subsequently appointed prof. of astronomy and optics in the Palatine schools at Milan, and superintended the erection of the observatory in the Brera College, upon which he spent money of his own. After the dissolution of his order, he went to Paris 1774, and received a pension from the king. B. afterward went to Bassano, to superintend an edition of his works, on the completion of which he returned to Milan, but fell into a depression of spirits, which at last grew into complete insanity, in which he died. His works include dissertations on a great variety of important questions in mathematical and physical science, and were published collectively under the title *Opera Pertinentia ad Opticam et Astronomiam* (5 vols., Bassano, 1785). His name is connected with a theory of physics, first published in his *Philosophiæ Naturalis Theoria, Redacta ad Unicam Legem Virium in Natura Existentium* (Vienna, 1758). He was also a poet, and his Latin poem, *De Solis ac Lunæ Defectibus* (London, 1764), has been much admired.

BOSH, n. *bŏsh* [Turk. *bosh*, empty, vain: compare Scot. *boss*, hollow, empty]: silly nonsense; idle talk.

BOSH-BOK: see Bosch-bok.

BOSHES, n. *bŏsh′ĕz* [Ger. *böschung*, a slope]: the sloping sides of the lower part of a blast furnace, which gradually contract from the belly, or widest part of the furnace to the hearth.

BOSH-VARK: see Bosch-vark.

BOSIO, *bō′zē-ō*, François Joseph, Baron: 1769–1845, July 29; b. Monaco, in Sardinia: sculptor. He studied at Paris; and when only 19, returned to Italy, where he executed a multitude of commissions even at that early age. His reputation was greatly increased by the figures which, at the request of Napoleon, he executed for the column in the Place Vendôme. Louis XVIII. and Charles X. also patronized B., the former appointing him royal sculptor, the latter elevating him to the rank of baron. He had also several professional honors, being director of the Acad. of Fine Arts in Paris, and member of the Berlin Acad. of Arts. B.'s principal works are: the *Hercules* in the garden of the Tuileries; the incomparably beautiful *Hyacinth* in the Luxembourg; the *Nymph Salmacis*, a figure of wonderful grace and purity of outline; an allegorical figure of France, 7 ft. high, surrounded by the Muse of History and a group of Genii; the statue in the memory of the Duc d'Enghien; the

PANORAMA OF THE BOSPHORUS.

equestrian statue in the Place des Victoires, and the monument of Count Demidov, 30 ft. high, composed of six figures with bas-reliefs, etc. Besides these, B. executed a great multitude of busts of distinguished persons, such as the Emperor Napoleon, the Empress, Queen Hortensia, the king and queen of Westphalia, Louis XVIII., CharlesX., etc. B.'s works all are marked by grace of form, harmony of design, and elegance of finish. His style generally reminds one of Canova.

BOSJESMAN, n. *bŏs'jĕs-măn*: the Dutch equivalent of Bushman, or wild man of the woods—a name applied to one of the Hottentot tribes of south Africa n. of the Cape Colony, low in the scale of civilization: see BOSCHISMEN: BUSHMEN.

BOSKET, or BOSQUET, *bos'kĕt*, or BUSKET, *bŭs'kĕt* [F. and Prov. *bosquet*]: a grove; a compartment made by branches of trees regularly or irregularly disposed.

BOSKY, a. *bŏsk'ĭ*: bushy; woody; covered with boscage or thickets.

BOSNA-SERAI, *bŏs-nâ-sĕr-ī'*, or SERAIO, *sė-rī'o*, or SARAJEWO, *sė-rī-yā'vo* (Ital. *Seraglio*): cap. of the province of Bosnia (q.v.); beautifully situated in the midst of gardens on both sides of the Migliazza, an affluent of the Bosna, about 122 m. s.w. of Belgrade. Of its inhabitants the majority are Christian Bosniaks, the others Moslems and Jews. Four handsome stone bridges cross the river at different points of the city, which is adorned with many churches and mosques (among them a Christian cathedral), whose gilded domes and whitened minarets and spires give it quite an oriental appearance. B. has a palace built by Mohammed II., and an old castle on a height, erected 1263 by the Hungarian general Cotroman; its old walls are decayed, and it is now of no military importance. B. has manufactures of tin, iron, and copper goods and trade in dyeing. Its position makes it an important commercial entrepôt. It has also valuable iron mines and mineral baths in the vicinity. The city was taken and occupied by the Austrians after a sharp engagement 1878, Aug. Pop. 26,300.

BOSNIA, *bŏz'nĭ-â*: till 1878 a Turkish vilayet, now a province of the Ottoman empire occupied and administered by Austria. Till 1876 it included Herzegovina (q.v.), and still comprises the hitherto Turkish parts of Croatia and Dalmatia. It is bounded n. by the Save and Unna; e. by the Vrina, the mountain-chain of Jublanik, and a branch of the Argentaric Alps; s. by the Scardagh mountains; and w. by the mountains of Cosman, Timor, and Steriza. At a few points in the s. it reaches to the Adriatic sea. Area, 20,000 sq. m. With the exception of the n. tract, extending along the Save, it is everywhere mountainous, and is traversed by more or less elevated ranges of the Dinaric Alps, whose highest peaks rise from 5,000 to 7,700 ft. above the sea, and are covered with snow

from Sept. to June. The mountain slopes are for the most part thickly covered with forests of oak, beech, lime, chestnut, etc., of magnificent growth, and only here and there exhibit meadows, pastures, and cultivated spots. The principal river of the country is the Save, on the n. border, into which flow the Unna, the Verbas, the Bosna, and the Drin. The Narenta and the Boyana fall into the Adriatic. The air is salubrious, the climate temperate and mild. It is only in the plain that agriculture is carried on to a considerable extent; grain, maize, hemp, vegetables, fruits, and grapes are produced in great abundance; and their cultivation would be much more extensively and actively prosecuted, but for the heavy impositions laid upon this branch of industry by the Turkish government. Game and fish abound, as well as wild animals, such as bears, wolves, lynxes, etc. The country is celebrated for the breeding of sheep, swine, goats, and poultry; and bees, both wild and tame, are very numerous. The principal imports are foods, metal, and machinery; principal exports, coal, iron and copper ores, animals, hides, etc., and fruits. The population consists of Bosnians, Croats, Morlacks, Montenegrines, Turks, etc., the much greater part being of the Slavonian race. The Bosnians, or Bosniaks, who form about a third of the inhabitants, are partly Mohammedans (descendants of Slavonian Christians who changed their religion at the time of the Mohammedan conquest), and partly of the Greek and Rom. Cath. churches. They are brave, hardy, rapacious, and cruel; rude and repulsive toward strangers, yet among themselves they are peaceful and honest; they are also industrious, simple in their habits, and temperate. The Moslem women in B. are less secluded than in the other Turkish provinces, and have long enjoyed the liberty of appearing in public more or less veiled. The Croats, who form about a sixth of the population, belong partly to the Greek and partly to the Rom. Cath. Church; only a few are Mohammedans. They are principally engaged in agriculture, the feeding of cattle and the barter trade. The Morlacks dwell mostly in the district of Herzegovina, and are courteous and clever in business. They are inveterate enemies of the Turks. Three-fourths of them are Greek Christians, and the rest Rom. Catholics. B., in ancient times, was included in Pannonia; and previous to the 7th c., was governed by princes of its own, called Bans or Waiwodes, who became dependent on Hungary. Being conquered by the Turks, it was finally annexed to the Ottoman empire, 1522. A dangerous rebellion broke out, 1851. The insurrection which originated in Herzegovina, 1875, soon assumed the proportions of a national movement, and led to war between Turkey and Servia and Montenegro. The war of 1877–78 between Russia and Turkey followed; the treaty concluded at the close of it proposed to give B. administrative autonomy, but the Berlin Conference of 1878 resolved that B. should be occupied and administered

by Austria (the sanjak of Novi-Bazar being put under special arrangements). The Bosnians sympathized with and supported the Anti-Austrian and Pan-Slavonic rising in Herzegovina and Dalmatia, 1882. Pop. 590,000.

BOSOM, n. *bûz′ŭm* [AS. *bosum*, bosom: Ger. *busen;* Dut. *boezem*, a bosom]: the breast of a human being and the parts adjacent; the clothes about the breast; the seat of the passions; embrace; retreat; asylum; in *OE.*, wish; desire: ADJ. intimate; dear; confidential: V. to conceal; to cherish. BOS′OMING, imp. BOS′OMED, pp. *-ŭmd.*

BOSPORUS, n. *bŏs′pō-rŭs* (of which *Bosphorus* is an ancient and common variation) [L.—from Gr. *bospŏros*, the heifer's ford—from Gr. *bous*, heifer; *poros*, a ford]: a narrow sea; a strait. BOSPO′RIAN, a. *-rĭ-ăn*, pertaining to. It is the ancient name of the channel which separates Europe from Asia, and connects the Black Sea with the sea of Marmora. The name, which signifies Ox-ford or Cow-ford, was given to it because here, according to the legend, Io, transformed into a cow, swam across; or, as is very generally supposed, because it is so narrow that an ox might swim across. Afterward, as the same name was bestowed upon other straits, this was designated the *Thracian Bosporus.* Its s. and n. entrances have two light-houses each. Its shores are elevated, and throughout its length the strait has 7 bays or gulfs, with corresponding promontories on the opposite side. One of these gulfs forms the harbor of Constantinople, or as it is often called, the Golden Horn. The length of the Thracian B. is about 17 m., with a breadth of from little more than a third of a mile to two miles. At the middle of this strait, where it is about 3,000 in breadth, Darius made his bridge of boats when he marched against the Scythians. The B. has long been under Turkish control. Repeated European conferences, including that of Berlin, 1878, have confirmed the stipulation of the treaty made 1841, providing that no ship of war belonging to any nation but Turkey shall pass the B. without the consent of the Ottoman authorities.

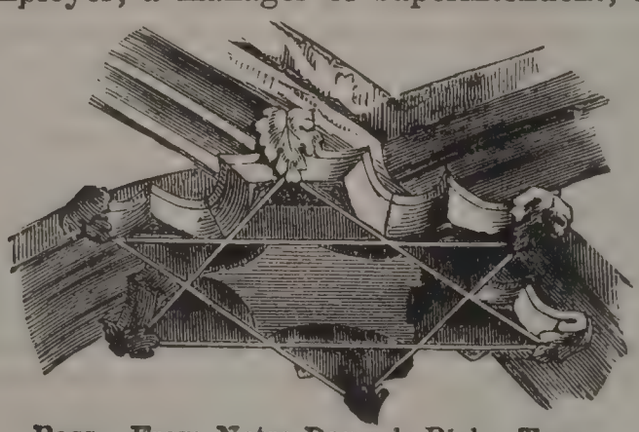
CIMMERIAN BOSPORUS was the name given by the ancients to the Strait of Kaffa (q.v.), also called the Strait of Yenikalé or of Theodosia, on the e. coast of the Black Sea. The country on both sides of the Cimmerian B. formed, in ancient times, the kingdom of Bosporus, founded B.C. 502. In B.C. 393 the kingdom was extended along the Asiatic coast; and Theodosia was united with it B.C. 360. The kingdom became tributary to the Scythians B.C. 290; and B.C. 116, Mithridates, King of Pontus, vanquished the Scythians, and set his son, Machares, on the throne of Bosporus. On the death of Machares, soon followed by that of Mithridates, the Romans gave the country, B.C. 63, to Pharnaces, second son of Mithridates, and after his assassination, to several princes who gave themselves out for descendants of Mithridates. When at last the family became extinct, A.D. 259, the Sarmatians made themselves masters of the kingdom, from whom the inhabitants of the Chersonesus took it 344. With Tauric Chersonesus, it afterward formed a part of the Eastern Roman empire, until the Chazars,

and afterward the Tatars, under Mongolian princes, made themselves masters of it. See TAURIDA.

BOSQUET, *bos-kā'*, PIERRE FRANÇOIS JOSEPH, Field-Marshal of France: 1810, Nov. 8—1861; b. Mont de Marsan, dept. of Landes. He entered, 1829, the Polytechnic School at Paris, and 1833 joined the artillery as sub-lieut. In 1834, June, he went with his regt. to Algeria, where he became conspicuous for military tact, energy, and valor. In 1847, he had attained the rank of col., and the following year he was named gen. of brigade by the republican government. In the end of 1853, he returned to France, and 1854 was appointed by the emperor gen. of division. He had the command of the second division of the French army in the Crimea, and at the battle of the Alma, Sep. 20, his successful maneuvers against the Russian left wing were mentioned in Marshal St. Arnaud's dispatch to the emperor as deciding the fate of the day. At Inkermann, Nov. 5, he contributed greatly to the defeat of the Russians. His conduct on this occasion was noticed with praise by Lord Raglan in his dispatch, and the British parliament voted its thanks to him in a special resolution. He also took a leading part in the capture of the Malakoff, 1855, Sep. 8; but a wound from the bursting of a shell compelled him to retire to France. In 1856 he was made field-marshal.

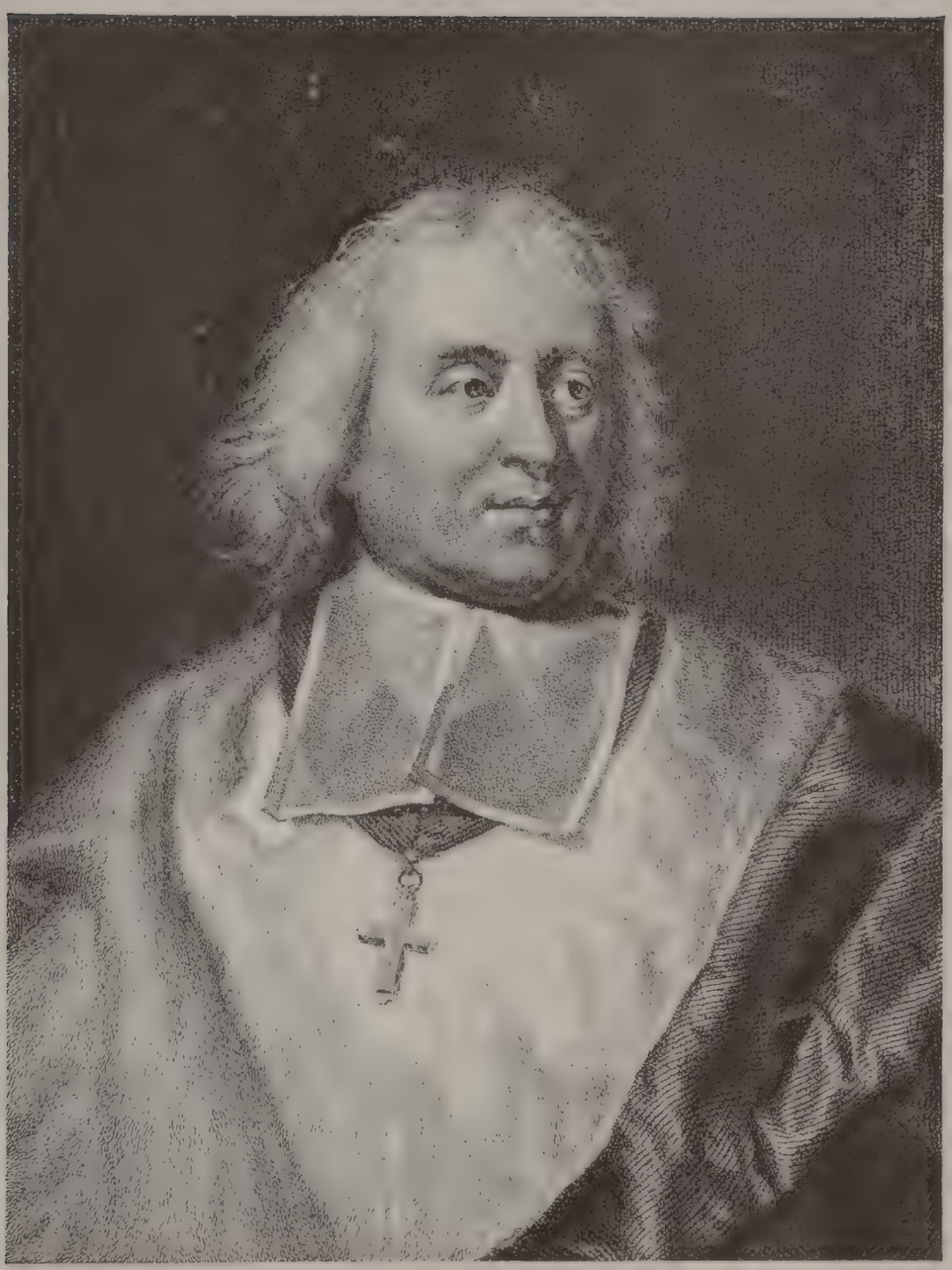
BOSS, n. *bŏs* [F. *bosse*, a bunch: Dut. *bosse* or *busse*, knob of a buckler: Ger. *bausch*, a projection: compare Scot. *boss*, hollow]: something raised from the surface; a protuberance; a stud or knob; in *geol.*, a rounded mass of rock that has resisted denudation, or a sudden protrusion of trap or other igneous rock; a short trough for holding mortar when tiling a roof; a frame of wood in the centre of a grain stalk to prevent heating. BOSSED, a. *bŏst*, studded; in *bot.*, having a rounded surface with a projecting point in the centre. BOSSY, a. *bŏs'sĭ*, raised. BOS'SES, n. plu. *-ĕz*, projecting ornaments used in *arch.* in various situations. BOSSAGE, in *building*, a stone left rough, projecting from the general face of the wall, usually intended to be wrought into a decoration at some later time.

BOSS, n. *bŏs* [Dut. *baas*, master]: a familiar slang word for an employer, a manager or superintendent; a master.



Boss.—From Notre Dame la Riche, Tours.

BOSS, in Architecture: a raised ornament, covering the intersections of the ribs of ceilings. They are more fre-



BOSSUET.

quently seen in vaulted roofs, as in the aisles of a church, but occur also where the ceiling is flat. In early Norman work there are generally no bosses, and they become richer and more frequent as advance is made toward the decorated and perpendicular styles. In the decorated style the B. usually consists of foliage, sometimes combined with animals, heads, and the like. Coats-of-arms, charged with armorial bearings, came then also to be used for this purpose, though they were more frequent in the perpendicular. Bosses were frequent also on shields.—The B. of a bit is the ornament with which a bridle-bit terminates at each end. It was borne in the arms of the corporation of Lorimers: see LORIMER.

BOSSI, *bos'sē*, GIUSEPPE: 1776–1816; b. Busto-Arsizio 19 m. n.w. of Milan: painter and writer. He made remarkable progress in his literary course at the college of Monza, commenced the study of art at Milan, sojourned at Rome, where he became an associate of Canova, and, on his return to Milan, became sec. of the Milan Acad. When Napoleon was in Milan in 1805, B. put on exhibition pictures of *Aurora and Night*, *Œdipus and Creon*, *The Italian Parnassus*, and M. Angelo's *Last Judgment*. He made also a copy of Leonardo's *Last Supper*, then almost obliterated. Besides a number of sonnets and canzones, he wrote *Il Cenacolo di Leonardo da Vinci*, as remarkable for taste as for erudition, which Goethe has translated into German.

BOSSI, LUIGI: 1785–1835, Apr. 10; b. and d Milan: Italian archeologist and historian. He studied at Pavia, and became a canon of the cathedral of Milan; but when the French entered Italy, he took the side of the invaders, and was appointed by Bonaparte agent of the French govt. at Turin, and afterward prefect of the archives of the kingdom of Italy. He was an extremely prolific author, and, dealing with such a multitude of various subjects, he has not escaped criticism. He produced more than 80 works, great and small, including theological and religious works, dissertations on antiquarian subjects, historic works, works on subjects connected with the fine arts, tragedies, comedies, etc. His *Introduzione allo Studio delli Arti del Disegno*, is instructive and much esteemed. His most important historic works are a much enriched translation of *Roscoe's Life of Leo X.* (12 vols., Milan, 1816–1817); *Researches concerning Christopher Columbus* (Milan, 1818); and a *History of Italy* (19 vols., Milan, 1819–1823).

BOSSUET, *bo-sü-ā'*, JACQUES BÉNIGNE: 1627, Sep. 27—1704, Apr. 12; b. Dijon: French pulpit orator: received his earlier education in the Jesuit college at Dijon, then went to Paris to the College of Navarre, where he studied the Sacred Scriptures, the works of classical antiquity, and the Cartesian philosophy. In 1652, he was made a doctor of the Sorbonne, and a canon in Metz. Here he was called by the bishop to reply to the Catechism of the Prot. minister, Paul Ferri, and this he did in a way that commanded the admiration even of Protestants. He soon attained great distinc-

tion as a pulpit orator, and 1661 he was made preacher to the court. His discourse on the occasion of Marshal Turenne's conversion to the Rom. Cath. church obtained for him the bishopric of Cordan. The king having, 1670, intrusted to him the education of the Dauphin, he resigned his bishopric 1671, because he believed that he would be unfaithful to his duty if he retained it during a continued absence from his diocese. He was now made a member of the Acad. The care with which he attended to the education of the Dauphin was rewarded, 1680, by his nomination as first almoner of the Dauphin, and 1681 by his appointment to the bishopric of Meaux. He was the author of the four articles, which secured the freedom of the Gallican Church, and the rights of the king in regard to it, against the aggressions of the pope; and his eloquence in the Assembly of the French clergy, 1682, obtained their adoption of these articles. In 1697, he became a member of the council of state, and in the following year first almoner to the Duchess of Burgundy. He spent the last year of his life in his diocese. He was strict alike in morals and in religious doctrine: his strictness in the latter he showed particularly in his controversy with Fénelon (q.v.) whom he accused of heresy for his defense of the Quietists (q.v.). His style is vigorous and artistic. His orations at the funerals of the Duchess of Orleans and the great Condé are particularly noted as master-pieces of this kind of eloquence. All his writings attracted much attention. For the defense of those dogmas of the Rom. Cath. Church which are rejected by Protestants, he wrote his *Exposition de la Doctrine de l'Église Catholique sur les Matières de Controverse* (Par. 1671). His greatest controversial work is his celebrated *Histoire des Variations des Églises Protestantes* (2 vols., Par. 1688), in which he founds his argument chiefly upon the doctrinal diversities of the churches of the Reformation. To the defense of the four articles of the Gallician Church he devoted his *Defensio declarationis celeberrimæ, quam de Potestate Ecclesiæ sanxit clerus Gallicus a.* 1682 (2 vols., Luxemb. 1730). With a view to the instruction of the Dauphin, he wrote his *Discours sur l'Histoire Universelle jusqu'à l'Empire de Charlemagne* (Par. 1681), a work particularly deserving of notice, as the first attempt at a philosophical treatment of history. The continuation of it to the year 1661 (Par. 1805) is entirely derived from materials which he left behind him, but to which the last touch of his own hand was wanting. Another fruit of his political and historical studies, was the *Politique tirée de l'Écriture Sainte* (Par. 1709). The most complete edition of his works is that published under the care of the Benedictines (46 vols., Versailles, 1815–19.)

His nephew, Jacques B., d. Bishop of Troyes, 1743, July 12. His extensive correspondence, chiefly devoted to the elucidation and investigation of the views of Fénelon, is included in the above-mentioned edition of the works of his uncle.

BOSSUT, *bo-sü'*, Charles: 1730, Aug. 11—1814, Jan. 14; b. Tartaras, near Lyon, France: mathematician and natural

philosopher. So early as the year 1752, he became prof. of mathematics in Paris, and 1768 was received into the Acad. of Sciences. The revolution deprived him of his situation and his income, and he lived in the greatest seclusion, and and in almost misanthropical discontentment, till under the Empire he was appointed a prof. in the Polytechnic School. His works are very numerous. The following are particularly valuable: *Recherches sur la Construction la plus avantageuse des Digues* (Par. 1764); *Recherches sur les Altérations que la résistance de l'éther peut produire dans le Mouvement des Planètes* (Par. 1776); *Nouvelle Expérience sur la Résistance des Fluides par d'Alembert, Condorcet, et Bossut* (Par. 1777); *Traité élémentaire de Mécanique et de Dynamique* (Charleville, 1763); *Cours Complète des Mathématiques* (7 vols., Par. 1795–1801); *Cours de Mathématique à l'Usage des écoles Militaires* (2 vols., Par. 1782); *Essai sur l'Histoire Générale des Mathématiques* (2 vols., 2d ed., Par. 1810), one of the best works on the history of mathematics; and *Traité du Calcul Différentiel et Intégral.* All his works are distinguished by methodical arrangement and great clearness. He was a great admirer of Pascal, and edited his works (15 vols. Par. 1779), to which he prefixed an introductory *Discours sur la Vie et les Ouvrages de Pascal.*

BOSTAN (El), *ĕl bos-tăn'*, or Albostan: town of Asiatic Turkey, pashalic of Marash, in a plain on the Sihun, on the n. side of Mount Taurus; lat. 38° n., long, 36° 23′ e. B. can be surrounded with water on the approach of an enemy; it has several mosques, and a considerable trade in wheat. It occupies the site of the Cappadocian Comana, which had a celebrated temple dedicated to a deity 'supposed to have been called *Ma* in the language of the country, and to be the moon-goddess.' Pop. 8,000–9,000.

BOSTANJI, *bŏs-tăn'jē:* class of men in Turkey who, originally the sultan's gardeners (the name being derived from *bostan*, a garden), now perform, in addition, a variety of duties, such as mounting guard at the seraglio, rowing the sultan's barge, and attending on the officers of the imperial household. They are under a chief called Bostanji Bashi, who holds the rank of pasha, and is governor of the sultan's residences, and steersman of his barge. He holds also the inspector-generalship of the woods and forests in the vicinity of the capital, has the jurisdiction of the shores of the Bosphorus and Sea of Marmora, and is, altogether, so important a functionary that only personal favorites of the sultan can hope to fill the office. The financial reforms of Sultan Mahmoud, however, have greatly lessened the emoluments of the post. The B. at one time amounted to 5,000, and were divided into companies like the janissaries, with whom they were united in military duty. In war time, their strength was 12,000. A scarlet bonnet, of excessive dimensions, formed the distinctive part of their costume. Their number now does not amount to more than 600.

BOSTON.

BOSTON: capital of Massachusetts, and of Suffolk co., ranking fifth in population among the cities of the United States; situated at the west end of Massachusetts Bay, on Boston harbor, at the mouths of the Charles and Mystic rivers, 190 miles by sea and 230 miles by rail northeast of New York city.

Boston harbor has an area of 75 sq. m., and, whether for defense or trade, is one of the best in the world. On the e. or seaward side, it is nearly inclosed between two headlands, and the space intervening is mostly occupied with islands, which leave between them only three practicable entrances. Its approaches are easy and safe, its entrances sufficiently wide and deep. Its large interior water space is divided by chains of islands in such a manner that ample roadsteads, sufficiently deep for the largest vessels, are easy of access, yet sheltered and tranquil. Five hundred ships of the largest class could anchor within them. On three of the islands are fortifications, Forts Independence, Warren, and Winthrop, of which only the last, on Governor's Island, is of modern character.

The original portion of the city of Boston occupies a peninsula extending toward the n.e. at the w. extremity of the harbor, and bounded on the w. by the estuary of the Charles river. Its original area, 783 acres, was increased to 1,066 acres, by land reclaimed from the water, especially at the Neck, once the narrowest, now the widest, part of the peninsula. In the 19th c. the city area was increased by the annexation of adjoining cities and towns or parts of towns — South Boston 1804, East Boston 1830, Roxbury city 1867, Dorchester town 1869, Charlestown city, and the towns of Brighton and West Roxbury 1873 — until it now comprises 27,532 acres, or nearly 45 sq. m. East B. is an island n.e. of B., important for its wharves and docks. South B. is a peninsula s.e. of B., and the seat of some of its most important manufacturing industries. Charlestown, a peninsula opposite B. on the n., contains Bunker Hill and a United States navy yard. Brighton, w. of B. on the mainland, contains extensive abattoirs. Roxbury, West Roxbury, and Dorchester, to s.w. and s., are attractive residential sections; the more remote parts abound in charming rural scenery, and are adorned by many villas and much tasteful landscape gardening. Of suburban cities not annexed, adjoining B., the chief are Cambridge, Somerville, Chelsea, Newton, and Malden, with population of from 92,000 to 34,000 respectively; most of these are inhabited chiefly by persons doing business in B.

Electric roads, a subway system, constructed in 1895–98 at a cost of $4,350,000, and an elevated railroad, opened in 1901, afford transit facilities throughout the city and suburbs. The East Boston tunnel, 1½ miles long, built of cement at a cost of $3,000,000, 90 ft.

below the harbor, is a further extension of the subway system. Beside railroad bridges, ten bridges for ordinary travel connect B. with Charlestown, Cambridge, and South Boston. The first of these, the Charles river bridge to Charlestown, 1,503 ft. long, was completed 1786, a great work for those days. Boston is the terminus of important railroad lines: the Boston and Maine and the Fitchburg railroads enter the North Station, and the Boston and Albany and the New York, New Haven, and Hartford lines, the great South Station, which is 800 ft. long by 700 ft. wide. Coast-wise steamers connect with the principal Atlantic ports and regular steamship lines with Europe.

The surface both of old B. and of the districts annexed is much diversified. Three hills at the w. of the peninsula gave it its original name of Trimountain or Tremont, the Indian name having been Shawmut. These now form one called Beacon Hill; at the n. end is Copp's Hill; Fort Hill, on the e. side, was levelled 1869, and subsequently used to fill up flats elsewhere. The reclaimed Back Bay district, on the w. side of the Neck, is now one of the fashionable residential sections. One of the most striking features of B. is the irregularity of the streets, an inheritance from colonial times, strongly contrasting with the checkerboard plan common in American cities. The original narrowness and crookedness has been to some extent removed by extensions, widenings, and improvements; the present configuration, not inconvenient to the practical inhabitant, has undeniably a quaint picturesqueness and charm.

B. was the first city in the United States to give attention to its architectural appearance, and is perhaps at present architecturally the handsomest large city in the country, excepting Washington with its public buildings. Substantial construction and finished appearance prevail. The finest section of residence grows yearly more beautiful. In the business portion of the city unusual opportunities were presented by the necessity of rebuilding the great 'burned district' left by the fire of 1872. The chief material used in the city is red brick, but granite also is abundant, and there is much use of various kinds of marble and sandstone. While in the commercial district a height of 125 ft. is allowed, in the residential section the legal height for buildings is restricted to 90 ft.

Of the public buildings belonging to the United States government, the most important is the great Post-office and Sub-Treasury building, completed at a cost of nearly $6,000,000. This is one of the most imposing edifices in the city. It is built of Cape Ann granite, in the Renaissance style. It accommodates the post-office, the sub-treasury, the pension office, the internal revenue office, and the United States courts. The custom-house, a massive granite structure, was finished 1847; it was the costliest public building of its time. The principal building belonging to the state government is the State House, on the summit of Beacon Hill, over-

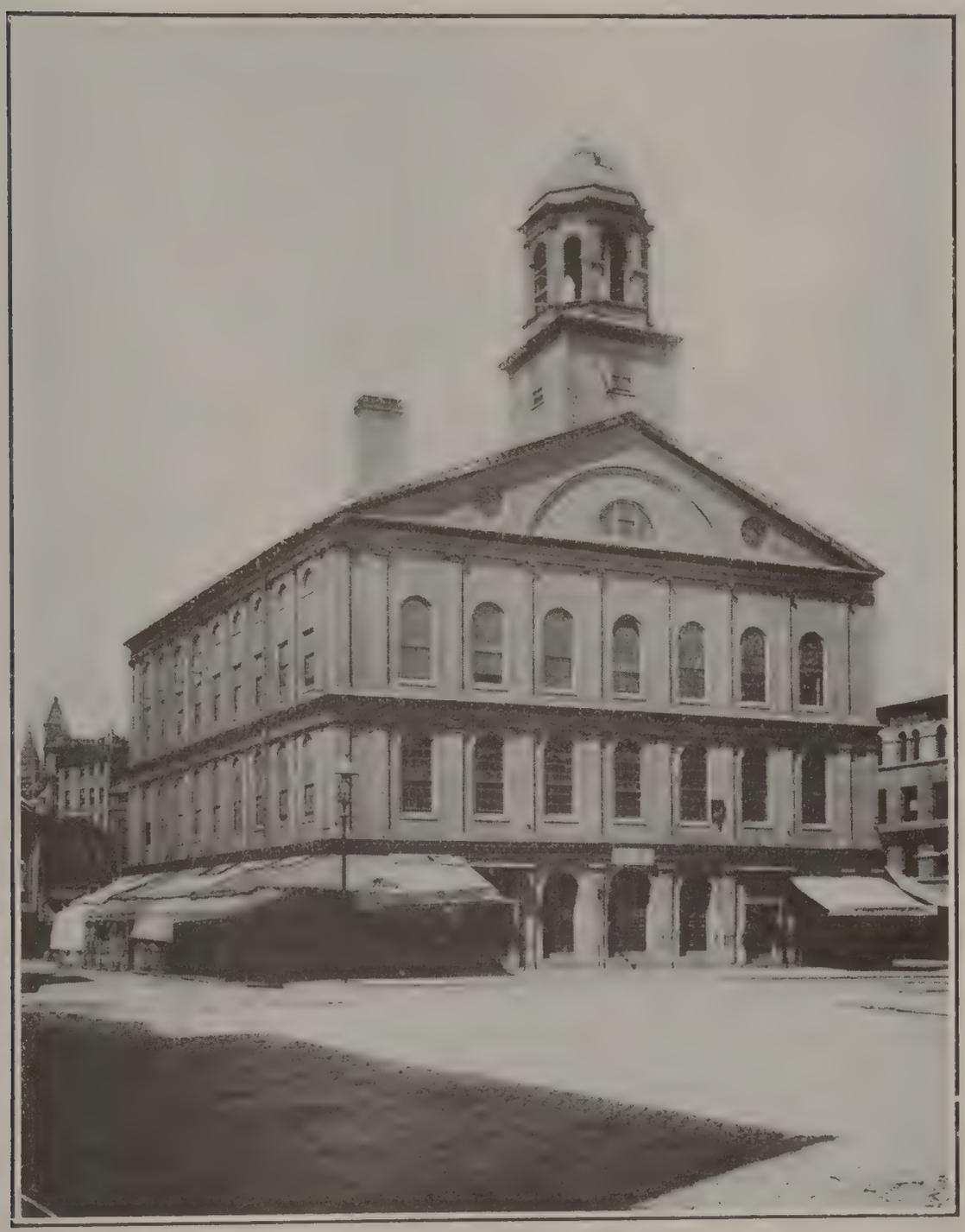
looking the common; its gilded dome is one of the most conspicuous objects to any one approaching the city. By its prominence, fancifully suggesting the hub of a wheel, it has given occasion to the jocular saying (in allusion to the good opinion which Bostonians hold concerning their city) that, to the Boston man, 'Boston State-House is the Hub of the Universe.' The State House was built 1795, and is still a handsome and effective structure. It accommodates the executive and legislative branches of the state government, and contains interesting statues and memorials, and the state library. The central offices of the city government are in the City Hall. The most interesting buildings, however, are Faneuil Hall and the Old State House. The original edifice of Faneuil Hall, the famous 'Cradle of Liberty,' was built 1740, and given by Peter Faneuil to the town for a town-hall; it was burned 1761, rebuilt 1762. It was the scene of the most exciting public meetings in the times preceding the Revolution, and has been used for similar purposes in all times of public excitement since. The Old State House is of not inferior historical interest. Built as a town-house 1748, it was successively the quarters of the colonial courts and legislature, the state house, and the city hall. It has been carefully restored to its original condition, and contains an interesting collection of antiquities. The old court-house, the scene of the Anthony Burns riot in 1854, has been replaced by the granite County Court-house, 450 ft. long, erected in a style of German Renaissance at a cost of $2,500,000. The grouping of dignified buildings on picturesque sites is exemplified by Trinity Church, the New Old South, the Public Library, and the Museum of Fine Arts around Copley Square; the Symphony Hall, the Horticultural Hall, the Conservatory of Music, and the Emerson College of Oratory around the junction of Massachusetts and Huntington avenues; while at the Fens, around the Charles River Basin, rise with distinguished effect the Isabella Stuart Gardner Museum, the graceful colonial style Simmons Technical College for Women, the five marble-faced buildings of the Harvard Medical School, completed at a cost of $2,000,000, three hospitals, churches, and other buildings. State Street is the financial center of the city; Washington, Tremont Park, Boylston, and Winter streets contain the large retail department stores; the wholesale dry goods establishments are on Franklin, Chauncey, Summer, and neighboring streets, and on Highland and adjacent streets are the largest boot and shoe markets in the world. In the very heart of the city is the Common, which from the earliest times has been reserved to the public, and is now a beautiful park of 43 acres; fine rows of old elms adorn the malls which form its borders. Adjoining it is the Public Garden, of 24 acres; elaborately laid out. Commonwealth Avenue, 240 ft. wide, a magnificent street with park-like centre, connects the Public Gardens with the park system of the annexed

districts. The park system of Boston is under the joint control of the Metropolitan Park Commission (appointed by the governor of Massachusetts) and the Board of Park Commissioners (appointed by the mayor of Boston). These commissioners serve without pay. In the Metropolitan system are included the Blue Hills Reservation (4,232 acres), the Middlesex Fells and Mystic Lakes (3,002 acres) and smaller reservations, including 66 acres at Revere Beach, where the State bath-house of 1,000 rooms provides the best facilities for sea-bathing. To the Board of Park Commissioners falls the management of the Marine Park at South Boston, Franklin Park at West Roxbury, Arnold Arboretum at Forest Hills, boulevards, fens, playgrounds, and open-air gymnasia. The Common Public Garden is in charge of the Public Ground Department of the city of Boston. The State commission acts in consultation with local boards, including that of Boston, and serves the people of 12 cities and 25 towns within a radius of 25 miles from the State House. The general park system thus provided is remarkable for its beauty, accessibility, and actual benefit to the community. The work of the city bath department is a characteristic example of municipal service to the people. The five trustees of this department maintain seven beach baths, one river bath, two swimming-pools, nine floating baths, five gymnasia, and the Dover Street bath-house, a model building with free baths for men and women throughout the year. The city has erected numerous statues, some of them of much merit; most of them represent the eminent public men of Massachusetts—Winthrop, Franklin, Samuel Adams, Prescott, Quincy, Webster, Everett, Mann, Sumner, Andrew. Recent statuary is represented by the bronze statue of William Ellery Channing, statues of William Francis Bartlett, Warren, Gen. Hooker, Phillips Brooks, and Gov. Banks. Of monuments, the most famous is Bunker Hill Monument, a granite obelisk 220 ft. high, erected 1825–43, on the summit of the hill on which occurred, 1775, June 17, the first great battle of the Revolutionary war. As landmarks of the earlier days of the city, there remain a few of the old houses of two hundred years ago, and a few of the mansions of a later time. The oldest of the old burial-places are the King's Chapel burying-ground, in which are the remains of Gov. Winthrop and other early worthies, the Old Granary burying-ground, containing the remains of more distinguished personages than any other in the city, and the burying-ground on Copp's Hill. The cemeteries now used all are outside the limits of the old city. There are over 300 churches and chapels of all denominations, including Roman Catholic, 48; Congregational, 42; Protestant Episcopal, 41; Baptist, 39; Methodist Episcopal, 36; Unitarian, 28. Christ Church, at the North End, is the oldest church-building, and remains unmodernized. It was built 1723, and is said to have been the church

from whose belfry the lanterns were hung out for Paul Revere. In the Old South Church, built 1730, many of the most stirring town-meetings of the Revolution were held; it is now occupied by an exhibition of historical and Revolutionary relics. King's Chapel, established as Episcopal, now Unitarian, built 1753, also is of interest. Of modern churches, Trinity Church is in the French Romanesque style, with a great central tower, 211 ft. high, and with interior decorations of extreme beauty. Near it is the new Old South Church, a superb structure. The buildings of the Unitarian Association, Tremont Temple, and of the First Baptist Church are notable, while the Christian Science Cathedral, opened in 1906, a type of Italian Renaissance, erected at a cost of $2,000,000, and seating 5,000 people, is the largest ecclesiastical edifice in New England, and one of the finest in the country.

B. contains nearly 20 hospitals, and 30 asylums and charitable homes. Of the former, the chief are the City Hospital, mainly for the gratuitous treatment of the poor, and with a capacity of over 500, and the Massachusetts General Hospital, a model institution of great extent and completeness, with an endowment of about $2,500,000. The McLean Asylum for the Insane, at Somerville, is a branch of this institution. Of other asylums, the Perkins Institution and Massachusetts School for the Blind, in South B., is one of the most important; it was here that the famous Laura Bridgman was educated. Other city charitable institutions are the House of Industry, House of Reformation, Truant School, and Home for Paupers, all on Deer Island; the Lunatic Asylum; Marcella St. Home; Home for Paupers, on Rainsford's and Long islands; the Almshouse, in Charlestown, and there are about 200 private charitable and benevolent societies in the city. Suffolk co. maintains a model House of Correction.

A great variety of literary, scientific, medical, and missionary societies are to be found in B., which has always been famous for its devotion to reformatory and scientific specialties. Literary coteries, however, are not now so influential as in the days when transcendentalism and abolitionism were in vogue. Among organizations having their headquarters here, are the American Acad. of Arts and Sciences, the Archeological Institute of America, the Mass. Historical Soc., the Mass. Horticultural Soc., the Mass. Medical Soc., and the New England Historic Genealogical Soc. Most of the societies mentioned issue important publications, and have valuable special libraries. The city has also many clubs and club-houses, some of which are of great elegance. There are several theatres in B., none of which have any great architectural pretensions as to exterior. The Boston Theatre, one of the largest theatres in the United States, has a seating capacity of 3,000. The Boston



FANEUIL HALL.

Museum, the oldest of the theatres, long noted for a permanent company of comedians of high merit, and for finished performances in standard English comedy, was pulled down in 1906. In the department of art the principal institution of the city is the Museum of Fine Arts, occupying a handsome building in the Italian Gothic style, with elaborate terra-cotta designs, near Trinity Church. The lower story contains a large and valuable collection of Egyptian, Cypriote, Greek, Etruscan, and Roman antiquities, and of casts of antique and specimens of modern sculpture. The second story is assigned to a fine collection of paintings, drawings, and engravings, and to textiles, furniture, pottery, porcelain, glass, etc. The city has also other public and many private collections of works of art. There are schools of drawing and painting maintained in the Museum of Fine Arts, schools of painting on porcelain, and of art needlework connected with the Soc. of Decorative Art, a school of sculpture, a state normal art school, etc. The city has a considerable number of painters, sculptors, and art clubs. There are also many musical clubs, several singing clubs of men being especially prominent. The Handel and Haydn Soc., founded 1815, is devoted to the production of oratorios. An extended series of symphony concerts, by the Boston Symphony Orchestra, is one of the principal elements of the city's musical life each winter. There is a large and handsome music hall, which seats 2,600. The New England Conservatory of Music, established 1867, includes 15 schools of instruction, has about 100 teachers, and over 2,000 students. Other musical colleges and conservatories are also in successful operation.

B. is justly celebrated for its schools, owning 304 buildings, renting 43, and maintaining 12 high schools. Over 85,000 pupils are enrolled in the public day schools, and over 12,000 in private and parochial schools. The average daily attendance in public day schools is over 75,000. In the regular day schools there are 1,758 teachers, in kindergartens 171, in high schools 246, and in night schools 261.

The system of public secondary instruction includes the English High School, the Public Latin School, the Girls' High School, the Girls' Normal School, the Girls' Latin School, the Evening High School, and the high school of the annexed districts. The Public Latin School in Boston, the oldest school in the United States, was founded 1635. Its main object has always been the preparing of boys for entrance to college, especially to Harvard. A great number of eminent men have been among its graduates — Cotton Mather, Hancock, Samuel Adams, Everett, Bowdoin, Robert C. Winthrop, Hillard, Sumner, Emerson, Motley, William H. Channing, Henry Ward Beecher, William M. Evarts, Phillips Brooks. The English High School was established

1821, to meet the wants of those not intending to obtain a collegiate education. Since 1881 these two have been housed in a magnificent new building, perhaps the largest free public-school building in the world, erected at a cost of $750,000. This edifice occupies a parallelogram 423 ft. long, by 220 ft. wide, with two interior courts. It is of brick, in the Renaissance style, with sandstone trimmings, and such external ornamentation of terra-cotta. It contains 78 rooms and halls, including a drill-hall, a gymnasium, two libraries, lecture halls, assembly-halls, rooms for drawing, laboratories, and 48 school-rooms. The vestibules are adorned with marble statuary. The Girls' High School also occupies an extensive building, containing 66 rooms and halls; and many of the grammar schools occupy buildings remarkable for excellence of design and completeness of appointments. The Latin School for Girls was established 1878, to furnish a training for girls similar to that given to boys at the Public Latin School. Girls pass from it, on graduation, to the colleges for women. At first it was regarded as an experiment; its success is now assured. The Normal School for Girls was established 1852, for the training of female teachers. Roxbury, Dorchester, Charlestown, Brighton, West Roxbury, and Jamaica Plain (a part of the West Roxbury district) have each its high school. The city also supports a school for deaf-mutes, evening industrial schools, and a manual training school. The excellence of the public school-system long retarded any considerable development of private schools in Boston. Conspicuous among these are the kindergartens, established and supported as free kindergartens mostly for the children of the poor, by Mrs. Quincy Shaw, daughter of Prof. Agassiz. Prominent among private schools of secondary grade or preparatory to college are, in B. proper, the Chauncey Hall School, and in the Roxbury district, the Roxbury Latin School, a free endowed school, founded 1645, and second in antiquity to the Latin school in B. only among the schools of the country.

Of higher educational institutions the city contains two, B. University and B. College. The former, an institution for both sexes, was incorporated 1869, and is under the auspices of the Meth. Epis. Church. Its endowment fund is of more than $1,000,000. It consists of a school of theology, a college of music, a school of law, a college of liberal arts, corresponding to an undergraduate department, a school of medicine, and a school of all the sciences, or graduate department. The attendance of students in these departments has risen to several hundreds. With these departments is affiliated, as an agricultural department, the Mass. Agricultural College at Amherst. The university now occupies handsome buildings, completed 1882. The Bos-

ton College is a Rom. Cath. institution, founded 1860, by the fathers of the Society of Jesus. Harvard College, at Cambridge, the chief educational institution of Massachusetts, has been so intimately connected with the life of B. as almost to make fitting a mention of it in this article. Its medical department, the Harvard Medical School, is located in B., in fine new buildings, admirable in arrangements and appointments. One of the most important educational institutions of the state, at B., is the Mass. Institute of Technology, one of the earliest technical schools in the United States. It was opened 1865, and has since had rapid and secure development. It now consists of a School of Industrial Science giving both theoretical and practical instruction in such sciences, together with training in the associated professions; a School of Mechanic Arts; and the Lowell School of Practical Design. This last is provided by the trustees of the Lowell Institute, founded 1839 by the will of John Lowell, Jr. The Lowell Institute also provides courses of lectures and instruction for advanced students and for general audiences in the city. A great number of lectures are annually given in B.; for these and other purposes there are 150 halls, of which the largest is Mechanics' Hall, in the permanent exhibition building of the Mass. Charitable Mechanic Assoc. This hall has a seating capacity of 8,000.

B. is exceptionally well provided with libraries, nearly all freely accessible. The Public Library, established 1854, is now the largest library in the United States, with the exception of the library of congress. The new building opened in 1895 cost $2,368,000 and is of Italian Renaissance type. It is notable for its fine decorations, mural paintings by Puvis de Chavannes, Sargent and Abbey, a fountain by Martigny, allegorical groups by St. Gaudens, and exquisite bronze doors by French. The library contains over 850,000 volumes, and has several branches, delivery stations, and reading rooms.

The Boston Athenæum, a society incorporated 1807, has a library of about 600,000 vols. and 50,000 pamphlets, supported by a fund of over $500,000. Other important libraries are those of the State and of the Massachusetts Historical Soc., and the Congregational Library. The library of Harvard University, numbering about 300,000 titles, also is accessible. Though not holding the literary pre-eminence which it had a generation ago, B. is still an important centre of publication, especially for books of superior literary grade. The long celebrated *Atlantic Monthly*, the *Andover Review*, and many other periodicals, are published here. B. has several daily newspapers, besides weekly, monthly, and quarterly publications. The first newspaper of the new world, the *Boston News-Letter*, was started here 1704. Many of the distinguished writers of America reside in or near B.

BOSTON.

The city government consists of a mayor elected for two years at an annual salary of $10,000, a board of 13 aldermen elected annually by districts and paid, and a common council of 75 members, chosen in the 25 wards annually and unpaid. The departments are arranged in five groups. The police commissioners have charge of the issuance of liquor licenses, the fees for which range from $500 to $2,000; there are over 780 saloons in the city. The police force consists of 1,225 patrolmen and officers. The fire department has 738 regulars, 79 callmen and 30 substitutes with an equipment of 51 fire engines, 14 chemical engines, 2 fireboats, and 3 water towers.

The public system of water-works in B. dates from 1848, when a supply was introduced from Lake Cochituate, a lake of 800 acres, 20 m. distant. The flow of Sudbury river was subsequently added, more than doubling the supply, which is received into the Chestnut Hill Reservoir, of 125 acres, with a capacity of 732,000,000 gallons, while since the commencement of the 20th century $30,000,000 has been spent on the vast Wachusett Reservoir at Clinton with its total shore line of 35½ m., a maximum depth of 129 ft., a dam 1,250 ft. long and 175 ft. thick at its base, a water level 395 ft. above high tide in Boston harbor, and a storage capacity of over 63,000,000,000 gallons. This artificial lake buries the ancient town of West Boylston, 80 ft. deep. Gas and electric light and power are supplied by private companies. The modern system of sewerage includes 622 miles of sewer, great pumping works, and a reservoir capacity of 7,850,000,000.

Manufacturers are represented by 727 different industries and 7,247 establishments, according to recent statistics, employing annually $143,311,376 capital and 72,142 hands, paid $39,184,191 for wages, $99,557,019 for materials, and $23,652,792 for miscellaneous expenses, and had products valued at $206,081,767. The principal industries according to capital employed were: wholesale manufacture of men's clothing $14,884,507; printing and publishing $19,081,495, foundry and machine-shop products, $9,371,928; liquors, $7,518,668; boots and shoes, $8,930,528; brick and stone, $4,976,230; confectionery, $4,455,184.

Since 1902, $8,000,000 has been spent on the improvement of Boston Harbor by a broad waterway, 35 ft. deep which leads from the wharves to open sea. The foreign commerce is second only to that of New York in the United States, the annual exports reaching nearly $87,000,000 and the imports over $78,000,000. Woolens, cottons, shoes, hides, leather, and fish are the chief items of trade.

B. has 34 national banks, with $33,850,000 capital; $21,701,037 surplus; $178,973,545 deposits; $165,895,-

018 in loans, and also has 16 co-operative banks, 17 savings banks, and important insurance, railroad, and mining interests. The exchanges at the United States Clearing House aggregate annually nearly $7,000,000,000, the second largest in the country. Recent statisties give the assessed valuation of real estate at $985,594,400, personal property $236,155,523 — total $1,221,749,923. The tax rate is $14.80 per $1,000.

B. was founded by English colonists, led by Winthrop, 1630, and named from Boston in England. During the colonial period it was famous as the headquarters of New England Puritanism, and as a centre of resistance to royal authority. Many of the exciting events preceding the Revolution took place here, such as the Boston Massacre 1770, and the Tea Party 1773. The measures of the British government were directed especially against it. In 1775 it was occupied by Gen. Howe, and invested by Gen. Washington, who compelled its evacuation 1776. A city government was conferred 1822. B. was the centre of transcendentalism and of the anti-slavery movement. In its early politics it adhered to the Federalist and Whig parties, but is at present Democratic. In 1872 a great fire burned over 65 acres of valuable business property, destroying 776 buildings at a total loss of $75,000,000.

The population in 1890 was 448,447; 1900, 560,892; (1910) 670,585.

See Winsor, *Memorial History of Boston*, 4 vols. 1880–81; Shurtleff, *Topographical and Historical Description of Boston;* Hale, *Historic Boston and Its Neighborhood*, 1898; Drake, *Old Landmarks of Boston*, 1900.

BOSTON: ancient English borough and seaport in Lincolnshire, on both sides of the Witham, 28 m. s. e. of Lincoln. It is supposed identical with the Icanhoe, where St. Botolph founded an abbey, 654, destroyed 870 by the Danes. Uuder the Normans, B. became a place of importance, and in 1204 it paid the largest dues (£780) of any English port except London (£836). In the reign of Edward III., many foreign traders settled, and the merchants of the Hanseatic League established a guild in B. After their departure, the town declined, and the suppression of the monasteries by Henry VIII. further injured it; but his grant of a charter of incorporation, and Mary's subsequent grant of extensive lands, partly compensated for this. The modern town consists chiefly of two good streets, one on each side of the river. The parish church of St. Botolph (1309), 245 by 98 ft. is one of the largest without cross aisles in England, and has a fine tower 300 ft. high, surmounted by a lantern visible 40 m. at sea. The church was partially restored 1857 at the expense of the inhabitants of Boston, Mass., which was named from the English city. The clearing of the river

of silt and the closing of the adjacent fens have greatly promoted the trade of B. Vessels of 300 tons can reach the heart of the town, and besides a thriving deep-sea fishing industry, an active coasting and foreign trade is carried on. The chief export is corn. B. is a great market for cattle and sheep, and manufactures canvas, iron, brass, ropes, leather, bricks, whiting, and hats, Population 1891, 14,570; 1901, 15,667.

BOSTON: a game of cards, played by four persons; named after the city of Boston, some features of the game being said to have reference to its seige. B. has been called the North American *whist.* There are three varieties. Fifty-two cards are used. Five cards to each player are dealt twice round, then three cards to each. A second pack is cut for the trump. The counters are kept in fine baskets, one for each player, and one placed upon the centre of the table. If the first player judges that he can take five tricks, he announces, 'I go Boston.' The others may overbid, saying, 'I go 6,' '7,' '8,' etc. Any failure to take the announced number of tricks involves a forfeit.

BOS'TON, THOMAS: 1676, Mar. 7—1732, May 20; b. Dunse, Berwickshire, Scotland; of poor parents. After a hard struggle, he succeeded in entering Edinburgh Univ. 1691. He received license as a preacher, 1697, and he was then ordained minister of Simprin, and 1707 was translated to Ettrick, where he died. Of his voluminous works the best known is the *Fourfold State,* 1720, discoursing of man's paradisiacal integrity, his ruin by the fall, his begun regeneration on earth, and consummate bliss or woe hereafter.

BOSTON PUBLIC LATIN SCHOOL: oldest educational institution in the United States, founded 1635. John Cotton, minister of the First Church, bequeathed to it half of his estate. It has always been a free school, supported by private gifts and public funds from the town of Boston. Its first master was Philemon Pormont. Notable are the long terms served by headmasters Ezekiel Cheever (q.v.) (master 1670–1708), John Lovell (1730–76), and Francis Gardner (1831–76): The school is of high grade, and prepares boys for college. The average annual attendance is about 600 and there are 21 instructors. Many distinguished names are on the long roll of its pupils.

BOSTON UNIVERSITY: institution of learning in Boston, Mass., chartered 1869. Its nucleus was the Boston Theol. Seminary of the Meth. Episc. Chh., founded 1839, which was adopted as one of the 'schools' of B. U. 1871: the property of the seminary, amounting to abt. $250,000, was conveyed to the corporation of the university. The other 'schools' were founded successively as follows: School of Law 1872, School of Medicine 1873, and School of All Sciences 1874: these 'schools' are intended to follow a collegiate training. Those departments of the university

which do not imply a previous collegiate education are denominated 'colleges.' The first of the 'colleges' opened was the College of Music, 1872; the New England Conservatory of Music (in Boston) adopted the work of this college and constituted it its graduate dept. 1891. The Coll. of Liberal Arts, organized 1873, has the usual 4 classes—freshman, sophomore, junior, senior; besides graduate, special, and unclassified students; average annually 500 with 28 professors and instructors. The Mass. Agri. Coll. at Amherst serves as the B. U.'s College of Agriculture: its students, graduate and undergraduate, average annually over 200, faculty 24. The schools average annually in students and faculties as follows: theology, fellow 1, graduate students 18, undergraduates 130, professors and instructors 20; law, students 330, professors and instructors 12, lecturers 14; medicine, students 100, professors and instructors 60 The aim of the School of All Sciences is to afford to bachelors of arts of whatever college the means of post-graduate instruction; and secondly to meet the wants of graduates in theol., law, med. or other professional courses, who may wish to broaden and supplement their professional culture by study of related sciences, arts and professions. The scheme comprises thorough instruction in all cultivated languages and their literatures; all natural and mathematical sciences; all theological, legal, and medical studies; all fine arts; all branches of special historical study. As this school crowns and unifies the whole work of the University, its faculty consists of all regular professors of the different faculties, together with such additional instructors as the work of the school may require. Women are represented on the staff of professors and instructors as well as in the studentship. B. U. is the first university in the world organized throughout without regard to sex. The founders of the University were Isaac Rich, Lee Claflin, Jacob Sleeper, with Alden Speare as associate founder. Isaac Rich was the chief benefactor and 64 free scholarships perpetuate his memory. Besides these there are two fellowships and 200 other scholarships. The total annual enrollment of students averages 1,400, with 144 professors and instructors. The property of the institution is valued at over $1,518,000.

BOS'TRA: see BOZRAH.

BOSTWICK, *bŏst'wĭk*, ARTHUR ELMORE: author, cyclopedist, and librarian: b. Litchfield, Conn., 1860, March 8. He was graduated from Yale College, 1881, was substitute instructor and proctor there during 1883–4; taught in the High School at Montclair, N. J., 1884–6; was a member of the editorial staff of Appleton's *Cyclopedia of American Biography* 1886–8; was assistant editor of *The Forum*, 1890–92; from 1892–4 was associate editor of the *Standard Dictionary*, and office expert in physics; and since 1891 has been editor of the science department of the *Literary Digest*. He was chief librarian of the New York Free Circulating Library, 1895–9; librarian Brooklyn Public

Library, 1899–91; and has been chief of the circulation dept. of the New York Public Library since 1901, having charge of its 36 branch libraries. Since 1896 he has been a member of the Advisory Committee of the New York Public Education Association, and director of the People's University Extension Soc. since 1898; he was appointed a member of the University Councils of the New York State University 1904–8, member Council of the Amer. Library Assoc'n 1904–06 and Chairman Committee on Book-buying 1903–7. He wrote numerous articles for the *Cyclopedia of American Biography*, the *Annual Cyclopedia*, and the *Standard Dictionary*. He is the author (with J. D. Champlin) of *Young Folks' Cyclopedia of Games and Sports* (1890).

BOSWELL, *bŏz'wĕl*, JAMES, of Auchinleck, in Ayrshire: friend and biographer of Dr. Samuel Johnson 1740, Oct. 29—1795, June 19: b. Edinburgh. He studied at Glasgow, and for one year at the Univ. of Utrecht—in the same year (1763) in London making the acquaintance of Johnson, whom he had greatly admired and desired to know. Afterward he made a tour of Europe, visited Corsica, bearing a letter of introduction to Paoli, the Corsican leader, from J. J. Rousseau, and became enthusiastic for Corsican independence. He pub. 1768 *Account of Corsica* (3d ed. 1769), containing memoirs of Gen. Paoli, of whom he was a lifelong friend and admirer.

B. became a member of the Faculty of Advocates, 1766, but never applied himself with earnestness to the law. In 1773 he was admitted into the Literary Club instituted by Johnson. After Johnson's death, 1784, he employed himself in arranging the materials which he had collected, and preparing his long-contemplated biography. His *Journal of a Tour to the Hebrides* appeared 1785, his *Life of Samuel Johnson*, 2 vols., 1791. Both went through many editions. Boswell has been emphatically styled by Macaulay 'the first of biographers.' Beside the works already mentioned, he was author of one or two minor productions of temporary interest. In 1856, Dec., there was published a posthumous volume of *Letters of James Boswell addressed to the Rev. W. J. Temple, from the Original MSS.*, in which the gay, *insouciant* character of the man very strongly appears.

BOSWELLIA, *bŏz-wĕl'ĭ-a:* genus of trees of the nat. ord. *Amyridaceæ* (q.v.), having flowers with a small five-toothed calyx, five petals, and a crenulated glandular disk; a triangular capsule with three valves, three cells, and one seed in each cell; the seeds winged on one side; their cotyledons intricately folded, and cut into many segments. Two or three species only are known, of which the most interesting is *B. serrata* (or *B. thurifera*), the tree which yields OLIBANUM (q.v.), now very generally believed to have been the FRANKINCENSE (q.v.) of the ancients. It is a large timber-tree, with pinnate leaves, which have about ten pair of hairy serrated oblong leaflets, and an odd one, each leaflet

about 1–1½ inch in length. The flowers are small and numerous, in axillary racemes, and of a pale pink color. When the bark is wounded, the delightfully fragrant olibanum flows out, and hardens by exposure to the atmosphere. The tree is found in the mountainous parts of Coromandel, and is supposed to be a native also of other parts of India, and of Persia, Arabia, and perhaps Abyssinia. *B. glabra*, a very similar species, a native of India, also yields a resin, comparatively coarse, sometimes used for incense, and boiled with oil as a substitute for pitch.

BOSWELLISM, n. *bŏzwĕl-ĭzm:* the style of James Boswell. Boswell'ian, relating to or resembling Boswell.

BOSWORTH, or Market Bosworth, *bŏz'wėrth:* market-town in Leicestershire, Eng., on an eminence in a very fertile district, 12 m. w. of Leicester. Many of the people are employed in knitting worsted stockings. On a moor in the vicinity was fought, 1485, the battle in which Richard III. was slain, and which terminated the Wars of the Roses. On an elevation, called Crownhill, Lord Stanley placed the crown on the head of the Earl of Richmond, Henry VII. Here Simpson the mathematician was born; Dr. Johnson was an usher in the Free Grammar School, in which Salt, the Abyssinian traveller, and Richard Dawes, the Greek critic, were educated.

BOSWORTH, Joseph, English philologist: b. Derbyshire, 1789; d. 1876, May 27. He was educated at Repton, Aberdeen, and Trinity College, and was ordained deacon in 1814, and after filling several livings in England was British chaplain at Amsterdam and Rotterdam for 12 years. He devoted much time to researches in Anglo-Saxon and its cognate dialects, the result of his studies appearing from time to time. His chief works are his '*Anglo-Saxon Grammar; Dictionary of the Anglo-Saxon Language;* and *Compendious Anglo-Saxon and English Dictionary.*' In 1857 he was presented to the rectory of Water Shelford, Buckingham, and next year was appointed Rawlinson professor of Anglo-Saxon at Oxford, a post which he held till his death.

BÖSZÖRMENY, *bė-sėr-mān:* chief of the six towns of the free district of Hajduk, in the east of Hungary, about 10 m. n.n.w. of Debreczin. It has active trade in rye, tobacco, water-melons, soda, and saltpetre. Pop. 25,100.

BOTAL, *bō-tâl'*, or Botalli, *bō-tâl'lē*, Leonardo: b. Asti, Italy, about 1530: distinguished physician and author of medical works. To him has been ascribed the discovery of the opening between the auricles of the heart, still called the 'foramen of Botal,' but it had been spoken of by Vesalius and by Galen. The opening is closed at or near birth, and B.'s description was wrongly based on an exceptional case occurring in a grown person.

BOTALLACKITE, *bė-tăl'ăk-īt* [from the *Botallack Mine* (q.v.), where it occurs]: a variety of Atacamite occurring in thin crusts of minute interlacing crystals closely investing killas.

BOTAN'IC GARDEN: grounds in which plants are collected and cultivated for scientific study. The various economical applications of botany, however, in agriculture, manufactures, medicine, etc., are almost always particularly in view; and one great object of a B. G. is to bring to a country useful foreign plants, to determine the question of their suitableness to its climate, and to introduce those which may be cultivated with advantage. B. gardens are now deemed indispensable to the proper equipment of universities; they are reckoned among the public institutions of great cities, and even of nations, and are established in new colonies, not only for the sake of science, but as one of the means of promoting their prosperity. The first approach to a B. G. appears to have been made about 1309, in the garden of Matthaeus Sylvaticus, at Salerno; botanical science, however, being subservient to medicine. Of a similar character was the medical garden established at Venice, by the republic, 1333. The example of Venice was followed by other Italian cities, and plants from different parts of the world began to be collected. At length, about contemporaneously with the revival of botanical science in modern times, the first true B. G. was formed 1533 at Padua, by Musa Brassavola, for Gaspar de Gabrieli, a wealthy Tuscan noble; soon followed by those of Pisa, Florence, Bologna, and Rome. The first public B. G. was that of Pisa. A public B. G. was established at Padua 1545, by a decree of the republic of Venice, at the request of the professors and students of medicine. The republic of Venice greatly encouraged the study of botany by sending persons to the Levant, to Egypt, and even to India, to procure plants for this garden.—The B. G. of Leyden was begun 1577; it had in its infancy the care of Clusius and was brought to great perfection by Boerhaave, who was prof. of botany there.—The first public B. G. in Germany was established by the Elector of Saxony at Leipsic 1580, and was soon followed by others.—France had no B. G. till Louis XIII. established the *Jardin des Plantes* at Paris, begun 1610, completed 1634.—There was no public B. G. in England till 1632, when that of Oxford was founded by the Earl of Danby. Private botanic gardens, however, had existed in England for the greater part of a century.—The B. G. of Edinburgh, the first in Scotland, was founded about 1680, as a private B. G., by Dr., afterward Sir Andrew Balfour, a zealous naturalist, who had inherited a collection of plants formed by a pupil of his own, Patrick Murray, of Livingston, at his country seat, and transferred them to Edinburgh; and the city of Edinburgh afterward allotted to it a piece of ground, and allowed an annual sum for its support out of the revenues of the university.

The B. G. at Kew occupies a high place among British national institutions; it presents one of the richest collections of plants in the world, and has been greatly improved under the care of Sir William Jackson Hooker and his son, who succeeded him 1865. The *Hortus Kewensis* of Mr. Aiton, to whom the garden owed much of its pros-

perity in the 18th c., illustrates the greatness which it had even then attained. One of its chief glories is now its immense palm-house, finished 1848, which is 362 ft. in length, and the central part 100 ft. wide, and 66 ft. high.—A palm-house has, in like manner, greatly added to the attractions and value of the B. G. of Edinburgh. It is 100 ft. long by 60 ft. wide, and 70½ ft. high. These houses permit something of the stateliness and magnificence of the palms of the tropics to be seen in Britain.

The *Jardin des Plantes* has been prominent in the introduction and diffusion of useful and beautiful plants from all parts of the world. There is in France what may be called a system of botanic gardens—one at least in every dept.—to which plants are sent from the *Jardin des Plantes* and from which, as they continue to be multiplied by propagation, they soon find their way into the hands of nurserymen and private cultivators. The B. G. at Schönbrunn, in Austria, was begun in 1753 by the emperor, Francis I., and was supplied with West Indian plants at enormous expense. The gardens at Berlin have recently been extended and improved at the expense of the government. Portions of the garden are named The Rocky Mts., The Alps, etc., and upon these miniature mountains their characteristic flora has been planted. There are also swamps, streams, forests and deserts, each with its peculiar plant life. The garden at Bonn is small but very well adapted for morphological work. The garden at Munich is planned for experimental study. In the small garden at Amsterdam, Prof. De Vries has carried on the work upon which he has based his famous *Theory of the Origin of Species by Mutation.* In America the most important gardens are the B. G. of New York, the Missouri Bot. Garden at St. Louis and the garden of the Dept. of Agriculture at Washington. The B. G. of Harvard University has an excellent arboretum. The B. G. of Calcutta deserves to be mentioned as an important connecting-link between the botanic gardens of Europe and the botany of India. It has had the care of a succession of eminent botanists, and has been very useful both in transmitting Indian plants to other parts of the world, and in introducing valuable productions of other countries into India. At Buitenzorg, in the island of Java, the B. G. contain the finest display of tropical plants in the world. They are not only of great economic importance, but they are constantly visited by botanists who are given every opportunity for conducting their investigations.

In the laying out and arranging of botanic gardens, mere convenience and beauty are often regarded, and in other cases the interest of science determines the arrangement. A perfect adherence to a botanical system is, for obvious reasons, impossible; but a scientific arrangement of the plants in natural groups, so far as it can be conveniently accomplished, greatly increases the usefulness of a B. G., and facilitates the study of botany. Sometimes houses are devoted to particular orders of plants, as palms,

heaths, or orchids; sometimes to plants of particular habit, as aquatic plants; and sometimes portions of the garden are advantageously devoted to the exhibition, at one view, of plants valuable for particular uses, as cereals or corn-plants, plants yielding fibre, etc.

BO'TANOMANCY: divination by means of plants: see DIVINATION.

BOTANY, n. *bŏt'ă-nĭ* [Gr. *botănē*, herbage—from *boskein*, to feed, to graze: F. *botanique*]: that branch of natural history which treats of plants, their structure, functions, properties, habits, and relationships. BOTANIC, a. *bō-tăn'ĭk*, also BOTAN'ICAL, a. *ĭ-kăl*, relating to plants in general. BOTAN'ICALLY, ad. *-ĭ*. BOTANIST, n. *bŏt'ă-nĭst*, one skilled in the knowledge of plants. BOT'ANIZE, v. *-nīz*, to seek for plants for the purpose of study. BOTANI'ZING, imp. a. BOT'ANIZED, pp. *-nīzd*.

BOT'ANY: the science which treats of the Vegetable Kingdom (see PLANT). Everything that relates to plants is included in this science; there are, therefore, several great branches of it, in many respects very different from each other. The fundamental branches of botany are *Morphology*, *Physiology*, *Ecology* and *Taxonomy*. Many special subjects have been developed by combining with one or more of the foregoing certain special features; thus we have *Paleobotany* or *Fossil Botany*, *Economic B.*, *Medicinal B.* or *Pharmaceutical B.*, *Plant diseases*, *Plant breeding*, etc. *Morphology* is of prime importance not only in itself but because a knowledge of this branch is a necessary foundation for any thorough understanding of other phases of botany. The name Morphology (Gr. *morphos*, a form, and *logos*, a discourse) would indicate a study of forms, but as taught in the best schools morphology has a broader application, including not only external and internal structure, but also the origin and development of various organs and, most important of all, the evolution of the whole plant kingdom. As now taught in universities and in the more progressive high schools, a course in morphology begins with the lowest forms of plant life and traces the increasing complexity in structure and life conditions and at the same time shows, as far as possible, how the various groups are related to each other. The evolution of the plant body, the origin and evolution of sex, the origin of land plants, fertilization, development of the embryo, alternation of generations, the origin of the leaf, seed and flower, and many other important subjects are properly considered in a course in morphology. Several aspects of morphology have become so specialized that they are treated as separate subjects in many of the larger schools. Among these the most important are *Histology*, *Cytology* and *Anatomy*. Histology (see HISTOLOGY) originally consisted in a study of tissues. The methods of preparing material for microscopic examination are prominent in courses in this subject. Methods have become so perfected that sections of stems an inch or more

in diameter can be cut as thin as the thinnest tissue paper. To a person with good eyesight, the pollen grain of a lily is barely visible to the naked eye. With modern methods such a pollen grain can be cut into a dozen sections and mounted without losing or disarranging a single section; with the aid of a microscope, a photograph of a section may then be made, and from the negative a lantern slide can be prepared so that an exact picture of the pollen grain may be thrown upon the screen. The section, as it appears upon the screen, may be as much as 12 feet long and will show the internal structures with marvellous accuracy, even the thousands of tiny starch grains appearing as large as walnuts. *Cytology* deals more particularly with the structures and activities of the individual cell but is also concerned with the organization of cells into tissues. Cytological investigation has shown just what structures of the cell transmit hereditary characters from parents to offspring. The highest powers of the microscope are necessary for cytological work. *Anatomy* is a very old subject and was formerly concerned with a study of the mature structure of stems of higher plants. In the last decade the subject has been placed upon a more scientific basis and is contributing immensely to our knowledge of the natural relationships of plants. English botanists have been leaders in the new anatomy.

Physiology (see VEGETABLE PHYSIOLOGY) treats of the chemistry, physics and growth and movements of plants. *Ecology* is a more recently organized department of botany. It treats of the influence of environment upon plants and of plants upon their environment. Nearly the same subject matter is sometimes treated under the title of Geographic Botany (see GEOGRAPHICAL DISTRIBUTION) or Biology of Plants. *Taxonomy* (Gr. *taxis*, arrangement, and *nomos*, law) treats of the classification of plants. The subject is often called Systematic Botany. Until a century ago the history of botany was almost exclusively a history of Systematic Botany and of the real or supposed medicinal properties of plants. *Paleobotany, or Fossil* Botany, deals with the petrified plants of geological ages. The external form and the internal structure of fossil plants are often remarkably well preserved. Apparatus has been devised which will cut thin sections of the most refractory stone. The study of fossil forms has already furnished many "missing links" and has thus aided immensely toward an understanding of the relationships of plants. The study of the relations of fossil plants to particular strata or formations, and so to particular periods in the history of the earth, belongs to geology.

Plant Diseases already constitute a recognized branch of botany and, the subject being one of such commercial importance, has received the support of many governments. In the United States the government experiment stations have investigated many plant diseases and have devised effective cures. *Plant Breeding* is also an important subject which is being supported and developed by

the government. A few years ago the following task was assigned to a prominent plant breeder of the U. S. Dept. of Agriculture:—Produce an orange as large as the best navel oranges, with the most delicious flavor, with a skin that peels off as easily and with segments which separate as easily as those of a tangerine, without seeds, and which will be hardy up to the most Northern limit of the present orange growing region. The science and art of plant breeding have reached such a stage that the accomplishment of such a task is possible.

Economic B. includes all that relates to plants, considered with reference to these arts and to practical uses. That part of it which relates to medicinal plants has been often separately and elaborately treated under the name of Medical Botany. For notices of the more important plants affording food to man, and therefore cultivated in fields or gardens, in warm or in cold climates, and of those valuable for their timber, their fibre, or the dye-stuffs or medicines which they yield, see the various botanical titles.

For so much of the first principles of the science of B. as may fill up a part of the above outline, see Plant: Vegetable Chemistry: Vegetable Physiology.

Having thus endeavored to sketch an outline of the science of B., we must refer to the articles Plant, Vegetable Physiology, instead of attempting here to fill up a part of that outline by exhibiting the first principles of the science. It remains for us, in the present article, to give a very brief account of the history of B., and outlines of the systems of classification most deserving of attention.

History of B. and Outlines of Principal Systems of Classification.—In studying the early botanical writings one constantly finds that the lack of any accurate terminology and the lack of illustrations make it doubtful what plant the writer is trying to describe. Furthermore, even up to the 17th century when illustrations had become frequent, interpretations and speculations were ridiculous, e. g., a plant with a scaly fruit resembling the scales of a snake must be good for snake bites, the daisy must be good for diseases of the eye, the dogbane with fruit resembling the horns of an ox must be a cure for ox-like stupidity. Such botany, while interesting, is of little scientific value. In the scientific description of plants a multitude of terms is necessary and the terms must be used with great precision.

The necessity of classification and systematic arrangement of plants will be obvious from the fact that fully 190,000 species have been described. Two radically different methods of classifying plants have been prevalent, the *artificial* and the *natural* systems. In an artificial system plants are classified according to some single arbitrary character. A botany arranged according to such a system is like a dictionary in which the words are arranged alphabetically. The *natural* system aims to classify plants according to their actual relationships. Artificial systems have entirely passed away except as matters of history, and efforts are concentrated upon per-

fecting a natural system. The framing of a natural system involves great difficulty since it is based not upon a single arbitrary set of characters but upon the whole life history of the individual forms in all their relations. While such a system aims to express the real affinities which exist in the plant kingdom, it evidently must be at all times subject to modification and improvement as botanical science advances. A taxonomist should have a profound knowledge of morphology, physiology and ecology and he needs the highest powers of a philosophic mind. One of the greatest difficulties lies in the fact that the affinities of plants are not such that they may be arranged in a lineal series, but that they may be viewed as a multitude of groups arranged around centers which in their turn may be variously related to each other.

The rudiments of a natural system have always been sought after, and in some measure attained, when botany has been studied as a science—whenever it has become anything more than a mere acquaintance with a few plants and their names. The *genera* into which species are grouped by all botanists are natural, and are the basis upon which all classification proceeds in its further generalizations. Linnaeus recognized the importance of maintaining this character of the genera, and when a rigid adherence to his artificial system would have caused the division of a genus into parts, and the consequent separation of species very nearly allied, he kept the genus unbroken and maintained the usefulness of his artificial system, to the student desirous of finding the names of plants, by referring from one of its classes or orders to another for species exceptional among those of their genus as to the number of stamens or pistils, or their *diœcious*, *monœcious*, or *hermaphrodite* flowers.—The classification of species, however, into genera and larger natural groups, is connected as much with other branches of natural history as with botany; see NATURAL HISTORY; SPECIES; GENUS; VARIETY. For a discussion of some of the debated questions common to botany and zoology, see DARWINIAN THEORY.

The following sketch will give some notion of the development of the science of botany:—

It is recorded (1 Kings, iv. 33) that Solomon 'spoke of trees, from the cedar in Lebanon even to the hyssop that springeth out of the wall.' There is reason also to believe that Zoroaster gave some attention to plants and that this study early engaged some of the philosophers of Greece. The oldest botanical work which has come down to us is that of Theophrastus (q. v.), pupil of Aristotle, B. C. 4th c. His descriptions of plants are very unsatisfactory, but his knowledge of their organs and of vegetable physiology is wonderful, when we consider the low state of this branch of science through many centuries after his time. It was not, indeed, till after the revival of letters in western Europe, that it was again studied as it had been by him. About 400 years after Theophrastus, in the first c. of the Christian

era, Dioscorides of Anazarbus, Asia Minor—a herbalist, however, rather than a botanist—described more than 600 plants in a work, which continued in great repute through the middle ages, a proof of the destitution of that period of any botanical science of its own. About the same time the elder Pliny gave attention to B., and his writings contain some account of more than 1,000 species, but compiled from various sources, without much discrimination, and mingled with many errors. Centuries elapsed without producing another name worthy of mention in a history of botany. It was among the Arabians that the science next began to be cultivated, about the close of the 8th c. The greatest name of this period is Avicenna. Centuries again elapsed, a longer interval than before, during which it made no progress whatever. It was not till the beginning of the 16th c. that B. resumed its place as a science. The first to revive it was Otto Brunsfels, a German, who published 1530 his *Historia Plantarum Argentorati*, or History of the Plants of Strasburg, 2 vols., folio, illustrated with cuts. He was speedily followed by Bock or Tragus, Fuchs or Fuchsius, and other Germans, by Matthiolus and Csalpinus in Italy; Dodœns or Dodonœus in the Low Countries; De L'Obel, or Lobelius, Dutch physician at the court of England; Gesner in Switzerland; Dalechampa and Moulins, or Molinœus, in France, and by many others, for B. now began to be prosecuted wherever learning flourished, and with great zeal and success. Chairs of B. were founded in universities, botanic gardens (q. v.) were established in many places, and travellers began to explore even remote parts of the world. One of the greatest names of the latter part of the 16th c. is that of L'Ecluse, or Clusius, who travelled through many countries, encountering great perils and hardships in pursuit of his favorite science, and was finally prof. of B. at Leyden. The name of Dr. Turner, 'the father of English B.,' belongs more to the 17th c. than to the 16th. The number of species known and described had increased, in the beginning of the 17th c., to more than 5,000 but the study of them was much impeded by confusion of synonyms and by want of classification, while classification was rendered extremely difficult by imperfect knowledge of the structure and organs of plants. The foundations of a natural system of classification may be said to have been laid in the latter half of the 17th c., by Dr. Robert Morison, native of Aberdeen and prof. of B. at Oxford, followed toward the close of the c. by the celebrated Ray, one of the greatest naturalists that England has produced.

The application of the microscope in B. opened a new epoch of the science, about the middle of the 17th c. Henshaw and Hook, both Englishmen, were among the first to employ this instrument to good purpose in the examination of the organs and structure of plants; but the greatest eminence belongs to Grew, also an Englishman, physician at Coventry, and to Malpighi, an Italian, perhaps more celebrated for his zoological than for his bo-

tanical discoveries. Vegetable physiology now began to be recognized as an important department of botanical science.

In the latter half of the c. perhaps the most eminent name after Ray is that of Joseph Pitton de Tournefort, French gentleman, who devoted his whole life to the pursuit of botanical science, and who must be particularly noticed in a sketch of the history of B., on account of a system which he proposed, which was more generally received and employed than any other till the time of Linnæus. Another botanist of the same period, Rivinus, prof. at Leipsic, gave to the world a botanical system which was received to some extent in Germany. Tournefort's system was partly natural and partly artificial; that of Rivinus was perhaps the most perfectly artificial ever proposed.

The science of B. made rapid progress during the 17th and 18th c., both by the extension of botanical research in different parts of the world, and by the careful study of particular groups of families or plants. Its progress was promoted by the publication of many valuable descriptive works. Important discoveries were also made in vegetable physiology.

About the middle of the 18th c., the wonderful genius of Linnæus affected a great change in B., as well as in zoology. His name marks an epoch in the history of the science; not chiefly, however, in consequence of the new system which he introduced, nor even because of the discoveries which he made, but rather because he was able to make himself master of all that had been ascertained by his predecessors, and to exhibit it in lucid order. He gave also a great impulse to botanical studies, by the enthusiasm with which he inspired his pupils. And among the benefits which he conferred on B., in common with zoology, not the least considerable was the introduction of specific names to be used with the name of the genus as the designation of particular species.

From the time of Linnæus the process of B. during the remainder of the 18th c. became more rapid; and since the commencement of the 19th c. it has advanced with gigantic strides. A large space would be occupied by a mere enumeration of the names of those who have promoted it by their labors and discoveries. Some notion of what botanical literature has become may be formed from the fact that Pritzel, in his *Thesaurus Litteraturæ Botanicæ* (Leip. 1847–51), enumerates about 15,000 publications.

Von Haller, anatomist and philosopher, as well as botanist, was, of all the contemporaries of Linnæus, the only one who could be regarded as his rival. Of all the botanists of the latter half of the 18th c. the most deserving to be mentioned with the great Swede in the history of the science are Bernard de Jussieu, and his nephew, Antoine Laurent de Jussieu, who applied themselves with great earnestness to the study of the natural affinities of

plants and the formation of a natural system, a work which Linnæus himself attempted, and of the importance of which he was so sensible, that while acknowledging the imperfect success of his endeavors, he declared his resolution to persevere in them to the end of his life. The Jussieus traced the outlines of a system which the greatest botanists since their time have not so much sought to change as to complete. Among those who have labored with greatest success in this work, must be mentioned De Candolle, Fries, Endlicher, Brongniart, Meisner, Von Martius, Lindley, and Brown. The botanist last named acquired by his work on the plants of New Holland, published 1810, great eminence, not on account of new plants which he described, but on account of the light which he threw upon the most difficult questions connected with the structure of plants and vegetable physiology. Many remarkable discoveries in vegetable physiology have been made by Link, Meyen, Schleiden, Von Mohl, Lindley, Hofmeister, Sachs, Strasburger, and others.

The student may acquire a nearly complete knowledge of the Linnæan artificial system, without knowing much in reality of B.; but, even in beginning to learn the natural system, he must learn some of the first principles of the science. Jussieu followed Ray in dividing plants into three great primary divisions—*Acotyledones* (q. v.), *Monocotyledones* (q. v.), and *Dicotyledones* (q. v.); having respectively no cotyledon or seed-lobe, one cotyledon, and two cotyledons. And, however the names may be changed, or characters assumed from other parts of the plant, these great divisions of the vegetable kingdom still subsist; the *Acotyledonous* plants being also, according to characters taken from the stem, *Acrogenous* (q. v.); the *Monocotyledonous* plants, *Endogenous* (q. v.); and the *Dicotyledonous* plants, *Exogenous* (q. v.). Endlicher is the only botanist of great note who has attempted to make primary divisions of the vegetable kingdom essentially different from those indicated by Ray, and his attempt has not commended itself to general approval. De Candolle gave expression to an important truth in botanical science, when he united the two divisions of monocotyledonous and dicotyledonous plants under the common title of *Vascular plants*, in opposition to acotyledonous or *Cellular* plants; the vascular plants being the *phanerogamous*, and the cellular the *cryptogamous*. Lindley has endeavored to modify the natural system by dividing the *asexual* or *flowerless* (cryptogamous) plants into the two classes of *Thallogens*—with the stem and leaves undistinguishable—and *Acrogens*, with the stem and leaves distinguishable, thus limiting the term acrogens to those which have a distinct stem; and in like manner dividing the *sexual* or *flowering* (phanerogamous) plants into five classes, viz., *Rhizogens*, with fructification springing from a thallus; *Endogens*, and *Dictyogens*, with fructification springing from a stem, the wood of which is youngest in the centre, and the seed with a single cotyledon—the former having parallel-veined permanent leaves, and the

wood of the stem always confused; the latter having net-veined deciduous leaves, and the wood of the stem when perennial arranged in a circle around a central pith; *Gymnogens* and *Exogens*, having the wood of the stem youngest at the circumference, and always concentric, the seed with two or more cotyledons; the former having the seeds quite naked, the latter having them inclosed in seed-vessels. But others generally prefer the simpler division of phanerogamous or vascular plants into monocotyledonous or endogenous, and dicotyledonous or exogenous, the former including Lindley's endogens and dictyogens, the latter his exogens, gymnogens, and rhizogens; although the latter have only a provisional place assigned them, in the absence of well ascertained views of their structure.

One of the great advantages of the natural system is, that the plants which it brings together are very generally found to agree in their properties, as well as in their structural characters. There are, indeed, species which, in respect of their properties, are anomalous or exceptional in the genera or orders to which they belong; but these exceptions do not invalidate the general rule, according to which we expect the most deadly poisons in the order *Loganiaceæ*, bland mucilage and useful fibre in *Malvaceæ*, wholesome succulent herbage with a certain amount of acridity or pungency in *Cruciferæ*, etc., etc. The knowledge of the properties of genera and orders is of great use in guiding inquiry, and it is thus that modern science attains in rapid succession to discoveries of practical importance.

In the determination of the intermediate subdivisions of the natural system, botanists have not yet been so successful as with regard to these primary divisions, and the ascertainment of the characters and limits of lowest subdivisions—orders, tribes, and genera. Great difficulty has been found in arranging the orders of natural groups, although the attempt has been assiduously made by some of the greatest botanists. Endlicher recognized 7,205 genera or plants in all; and Hooker and Bentham's *Genera Plantarum* 7,565.

The study of B. has come to be something vastly different from the collecting of flowers, counting stamens and pistils, naming by means of an artificial key, or getting some one to name, and preserving in a herbarium. Flowering plants are but one of from 3 to 7 subkingdoms or branches of the vegetable kingdom (as variously constituted by different authors), the lower being the A B C to a proper knowledge of the higher, and to be studied whenever competent teachers and instruments can be secured. The lower require the microscope for any real examination; and even the elements of flowering plants, their tissues and special organs, cannot be studied successfully except with the aid of the microscope.

The majority of modern text-books of B. recognize four great groups of plants: Thallophytes, Bryophytes, Pteridophytes and Spermatophytes. I. THALLOPYTES: the vegetative body is usually a thallus—that is, without

differentiation into root, stem and leaf. The group may be defined negatively as including all plants below the Bryophytes. Thallophytes may be conveniently but not very naturally divided into algæ and fungi, the algæ containing chlorophyll and the fungi lacking it. The *Algæ* are classified as Cyanophyceæ (Blue green Algæ), Chlorophyceæ (Green Algæ), Phæophyceæ (Brown Algæ), and Rhodophyceæ (Red Algæ). The blue green and the green algæ are found in both fresh and salt water while the brown and red algæ are almost exclusively marine. In form and size the algæ range from single cells invisible to the naked eye, up to gigantic forms several hundred feet in length. Some of the microscopic forms, like the Diatoms, are remarkably beautiful. The green scums, so common on ponds, and the bright green, slippery masses on stones in running water are filamentous algæ which should be seen by every one who has access to a microscope. Many forms of red algæ—commonly called sea moss—are mounted upon cards and sold to tourists. The evolution of the plant body, and the origin and evolution of sex are among the important problems illustrated by the algæ. The *Fungi*, having no chlorophyll, are incapable of independent existence. Those which live upon living forms are parasitic, and those which live upon dead forms are saprophytic. The structure of many fungi bears unmistakable resemblance to that of certain algæ and botanists are generally agreed that fungi are degenerate algæ. Fungi may be divided into five groups, Myxomycetes, Bacteria, Phycomycetes, Ascomycetes and Basidiomycetes. The Myxomycetes, or Slime Molds, are extremely puzzling and it is not yet settled definitely whether they are plants or animals. Most of the investigation upon the group has been done by botanists. The Bacteria are responsible for so many diseases that many books and periodicals are devoted to the subject and Bacteriology has become an important science. The Phycomycetes, or alga-like fungi, show the most striking resemblance to the algæ. The white mold so common upon bread is a typical example. Both sexual and asexual reproduction are common, and in some forms the sperm-producing organs have degenerated and the eggs develop without fertilization. Many of the most ruinous plant diseases are caused by members of this group. The Ascomycetes are named from the fact that their spores are borne in sacs. The reproduction, in many cases at least, is sexual. Some of the most familiar Ascomycetes are the green molds found on cheese, old leather and upon bread; the mildews so common on leaves; the black knot on cherry and plum trees; the cup fungi of various colors on rotten logs and damp ground; and the morel, which the novice would mistake for a mushroom. The Basidiomycetes contain the mushrooms, toadstools and puff balls, the bracket fungi, rusts, smuts, etc. No sexual reproduction is known. II. Bryophytes: here belong the liverworts and mosses. Two distinct kinds of spores are produced, sexual and

asexual spores. The asexual spore produces a thallus or leafy body, the gametophyte, which sooner or later produces the gametes, or sexual spores, commonly called sperms and eggs. A sperm unites with an egg and the egg, thus fertilized, grows into a body which produces again the asexual spores, and the life cycle is complete. The structure which develops from the fertilized egg is called the sporophyte, which in this group never becomes independent but throughout its entire existence remains attached to the gametophyte. Thus there is a regular alternation of gametophytic and sporophytic plants, and this regular succession is called alternation of generations.

III. PTERIDOPHYTES: The Pteridophytes include the Lycopodiums, Equisetums and the True Ferns. The life history shows the same regular alternation of generations as the Bryophytes but in the Pteridophytes the sporophyte is dependent only during its early stages, the gametophyte soon decaying and the sporophyte becoming independent with its own roots and leaves. The origin of heterospory, the origin of the leaf and of the vascular system are perhaps the greatest problems of the Pteridophytes. In the Bryophytes the gametophyte is even more conspicuous than the sporophyte, while in the Pteridophytes the gametophyte is small and inconspicuous, and in the heterosporous forms is entirely included within the asexual spore. IV. SPERMATOPHYTES: Here belong all plants which produce seeds. They are subdivided in Gymnosperms and Angiosperms. In the Gymnosperms the seeds are not enclosed in an ovary but are exposed so that the pollen falls directly upon the ovule. The *Gymnosperms* are subdivided into the Cycads, Ginkgo, Conifers and Gnetums. The Conifers have a wide distribution and form great forests while the other three groups are very restricted in distribution and are not abundant. There is alternation of generations in all Gymnosperms but the gametophytic generation has become so reduced that it is only by its resemblance to the gametophytes of the heterosporous Pteridophytes that it was finally understood. In the *Angiosperms* the seeds are enclosed in an ovary and the pollen falls upon a stigma so that it is the pollen tube and not the pollen grain which reaches the ovule. Alternation of generations is characteristic of the group but the gametophytic generation is far more reduced than in the Gymnosperms. The gradual reduction of the gametophyte from its prominent position in the Bryophytes down to the mere vestige which remains in the Angiosperms affords an interesting study in comparative morphology. The sporophyte increases in prominence as the gametophyte decreases. The number of chromosomes seen in the dividing nuclei of a sporophyte is always double the number found in the dividing nuclei of a gametophyte. There are about 100,000 species of Angiosperms, of which about 20,000 belong to the Monocotyledons and 80,000 to the Dicotyledons. One might think of the lily as a type of the Monocotyledons and

of the rose and the morning glory as types of the Dicotyledons. Perhaps the nearest approach to a natural classification of the Angiosperms to be found in English is Britton and Brown's *Flora of North America*, which follows, in the main, Engler and Prantl's great work, *Die Natürlichen Pflanzenfamilien*.

The following text-books will furnish information upon many botanical subjects: Atkinson, *College Botany;* Campbell, *A University Text-Book of Botany;* Strasburger, Noll, Schenck and Karsten, *Text-Book of Botany* (English translation); West, *British Fresh Water Algæ;* Underwood, *Moulds, Mildews and Mushrooms;* Atkinson, *Mushrooms Edible and Poisonous;* Campbell, *Mosses and Ferns;* Coulter and Chamberlain, *Morphology of Gymnosperms;* Coulter and Chamberlain, *Morphology of Angiosperms;* Sachs, *History of Botany*, translated by Garnsey and Balfour.

BOT'ANY, Fossil: see Paleontology.

BOT'ANY BAY: a haven of New South Wales, lat. 34° s., long. 151° 15′ e., discovered by Cook on his first voyage, 1770, and named by him from the great number of new plants in its vicinity—a characteristic, however, rather of Australia in general than of this particular locality. In 1787 it received England's first penal colony in the east; and though it was supplanted the very next year by Port Jackson, a vastly superior harbor immediately north of it, yet it long continued to be the popular designation, not merely of this convict settlement, but of the Australian convict settlements generally. On the shore of B. B. there was erected, 1825, a column to the memory of that eminent French navigator, the unfortunate La Perouse.

BOTARGO, *bō-tär'gō* [Sp.]: a relishing sort of food, being a sausage made of the roes of the mullet fish, and eaten with oil and vinegar. It is much used on the coast of the Mediterranean as an incentive to drink.

BOTETOURT, *bŏt'e-tôrt*, Norborne Berkeley, a conspicuous actor in American colonial history: b. England, 1734 ( ); d. Williamsburg, Va., 1770, Oct. 15. He was sent to Virginia as royal governor in 1768. In 1769 the assembly passed resolutions remonstrating against parliamentary taxation and the right claimed to send them to England for trial. Lord Botetourt summoned the speaker and burgesses before him and dissolved them. The result was that a convention met in a private house and remonstrated with Parliament, sending its resolutions to the other colonies and to England. Lord Hillsborough wrote a letter to Lord Botetourt, assuring him that it was not the intention of government to tax the colonies, and that the obnoxious imposts would be withdrawn. The promise was not fulfilled in full, the duty on tea being retained. Botetourt was deeply mortified, and soon died of disease aggravated by mental suffering.

BOT--BOT-FLY and **GAD-FLY**: names common to many insects of the family *Œstridæ* (q.v.), or *Œstracidæ*, the genus *Œstrus* of Linnæus. The name bot is sometimes restricted to the larvæ, which appears to have been its original use, the other names being given to the perfect insects; the name gad-fly often to insects of the genus *Tabanus* (q.v.), to which some try to restrict it. The insects of this family are now supposed not to be those which were called *Œstrus* by the ancients, although, like them, extremely troublesome to cattle. They are dipterous (two-winged) (q.v.) insects, nearly allied to the *Muscides* (House-fly, Flesh-fly, Blow-fly, etc.), with small 3-jointed antennæ, and mouth destitute of a proboscis.—The Horse-bot, or Gad-fly of the horse (*Gasterophilus*, or *Gastrus*, or *Œstrus Equi*), sometimes also called the *Breeze* and *Horse-bee*, is much less common in Britain than in some parts of the continent of Europe, and occurs chiefly in elevated heathy districts. It is not quite half an inch in length, woolly,

Horse Bot-fly:

a, a horse-hair with eggs of bot-fly; *b*, one egg magnified; *c*, larva; *d*, pupa; *e*, perfect insect, a little larger than life.

with yellowish gray head, rusty thorax, abdomen, and the wings whitish, with brownish-gray spots. The abdomen of the female terminates in a blackish horny tube. In the latter part of summer, the female hovers about horses, and deposits her eggs on their hairs, where they remain attached by a glutinous substance until they, or the larvæ just emerging from them, are licked off by the tongue of the horse, their destined place being its stomach. It is believed that the fly deposits her eggs only on those parts which are accessible to the horse's tongue, seeming to prefer the back of the knee-joint, where they may sometimes be found in hundreds. The larva is yellowish, without feet, short, thick, soft, composed of rings which have a double row of short teeth surrounding them; it is somewhat acuminated at one end—the head; and the mouth is furnished with two hooks, one on each side, for taking hold of the inner coat of the horse's stomach, to which the B. attaches itself, and from which it derives it subsistence, hanging in clusters sometimes of three or four, sometimes of more than one hundred. Here it spends the winter and in the following summer, when it is about an inch.

long, it disengages itself, and being carried through the horse's intestines, burrows in the ground; and changes into an oval black pupa with spiny rings, from which, in a few weeks, the perfect insect comes forth. Multitudes, of course, become the prey of birds, before they can accomplish their burrowing.—It has been disputed whether or not bots are very injurious to horses; and some have even maintained that, when not excessively numerous, their presence is rather beneficial, an opinion certainly without apparent probability, while it is universally admitted, that in great numbers they are hurtful.—The Red-tailed Horse-bot (*G.* or *Œ. hæmorrhoidalis*), also a British species, deposits its eggs upon the lips of the horse, distressing it very much by the annoyance which it gives in so doing. The larvæ attach themselves chiefly to the surface of the intestine, about the anus of the horse, and

Ox Bot-fly:
***a*, larva, full grown, natural size; *b*, pupa; *c*, perfect insect, a little larger than life.**

sometimes cause an annoying irritation. Linseed-oil is used for their removal. The OX-BOT, or Ox Gad-fly of N. Amer. has lately been proved to be other than the *Œstrus*, now *Hypoderma bovis*, of Europe, and is named *H. lineata*. The eggs, deposited mostly on the flanks and heels of cattle and attached to hairs, are licked off into the mouth, and the larva begins a nine or ten months' travel through the animal's body, until in the late winter it reaches some point beneath the skin of the back, its further development going on in the ulcer there formed, whence it drops itself out and pupates in the ground. It is called Heel-fly in Texas. Persons tending cattle sometimes become infested; and the egged-hairs may be taken in milk. The eggs are living larvæ when taken into the mouth, and at once attach themselves to the soft membranes with which they come in contact.—The SHEEP-BOT (*Cephalemyia* or *Œstrus Ovis*) is a more serious pest than any other species, and is not infrequently very distructive to flocks. The insect is smaller than either the ox-bot or horse-bot; it is of a grayish color, with a large head and yellow face, and is most abundant in damp situations and woody districts. It is seen chiefly in the months of June and July.

Ovipositor of Bot-fly, highly magnified.

Sheep exhibit great alarm when it approaches them, and seem to seek, by keeping their noses close to the ground, and by incessant motion of their feet, to keep it from entering their nostrils. It is in the nostrils of the sheep that this fly deposits its eggs, and the larvæ, when hatched, make their way into the maxillary and frontal sinuses, feeding upon the juices there, until they are ready to change into the pupa state, in April or May of the following year, when they find their way again through the nostrils to the ground. They seem to cause great irritation in their progress up the nostrils of the sheep, and the poor animals run hither and thither, snorting and in great excitement. The bots cause considerable irritation in the cavities, where they usually fix themselves, and sometimes get into the brain, and cause death.—These larvæ move with considerable quickness, holding on by the hooks with which their mouth is furnished, and contracting and elongating the body. Goats, deer, and other quadrupeds also are liable to be assailed by different kinds of gad-fly. The

Sheep Bot-fly:

a, larva, full grown; *b*, larva, younger; *c*, pupa; *d*, the face of the perfect insect, magnified; *e*, perfect insect, natural size; *f*, perfect insect, magnified.

eggs of one of the species which attack the fallow-deer, are deposited in the nostrils, and the larvæ make their way in large numbers to a cavity near the pharynx. Reindeer are excessively tormented by these insects, one kind depositing its eggs in their nostrils, and another in their skin; and it is no infrequent thing for a large part of a flock to be destroyed by them. When feeding where bot-flies are numerous, they keep such a watch against them, that they neglect to eat, become emaciated, and often actually perish in consequence. The 'ver macaque' of Cayenne and Mexico, is found beneath the skin of man in tropical America. It is disputed whether it be a true indigenous '*Œstrus hominis*,' or one that originally attacks the monkey, dog, or other mammals. In Cayenne the species attacking man is called the 'ver macque'; in Eastern Brazil (Para) 'ura'; in Costa Rica, 'torcel'; in Columbia, 'gusano peludo,' or 'muche.' The 'ver moyocuil' (*D. noxialis*) lives on the dog, sheep, cattle, and man; and is found in Mexico and New Granada. The larvæ are long, cylindrical, S-shaped,

differing greatly in form from others of this family. The flies are closely allied to those of the preceding genus.

BOTCH, n. *bŏch* [It. *bozza*, a swelling: F. *bosse;* Dut. *botse*, a lump or boil; *butse*, a contusion—from *botsen*, to strike: Gael. *boc*, a blow, a pimple]: a red swelling on the skin, particularly the face; a blotch; a pimple. BOTCHY, a. *bŏch'ĭ*, marked with botches; see BOTCH 2.

BOTCH, v. *bŏch* [Swiss, *batsch*, a lump of something soft, a patch—from *batschen*, to put on a patch: Ger. *büssen*, to mend: It. *bozza*, an imperfect piece of work: Gael. *boidsear*, a stupid fellow]: to work without knowledge; to mend or patch clumsily: N. an imperfect and bungled piece of work. BOTCH'ING, imp.: N. the repairing, mending, or making clumsily. BOTCHED, pp. *bŏcht:* ADJ. done imperfectly and clumsily. BOTCH'ER, n. one who; a mender of old clothes. BOTCHERY, n. *bŏch'ėr-ĭ*, clumsy addition; only patchwork. *Note.*—The two preceding entries are intimately connected in their etymologies and meanings.

BOTH, a. conj. *bōth* [AS. *butu* or *batwa:* Icel. *badir:* Sks. *ubha:* Ger. *beide*]: the one and the other; the two; as well.

BOTH, *bōt*, JOHN and ANDREW: celebrated painters, who, being united in their works like Beaumont and Fletcher, are, like them, usually spoken of together: b. Utrecht, where their father was a painter on glass—John in 1610; the date of Andrew's birth is not known. After studying under Abraham Bloemart, the brothers went to Italy, where they soon won high reputation. John painted landscapes, adopting Claude for his model, while Andrew filled in the figures after the style of Bamboccio, and in so careful a manner that the pictures looked like the work of one hand. John's landscapes are characterized by delicious warmth of sky, softness of distance, and general truthfulness to nature; even the different hours of the day may be distinguished in some of his best pictures, so careful are his tints. The works of the brothers are still in great repute, and bring high prices whenever offered for sale. One of the brothers was accidentally drowned in a canal in Venice, 1650; the other then settled in Utrecht, where he died six years afterward.

BOTHER, n. *bŏth'ėr* [Gael. *both*, perturbation: Ir. *buaidhirt*, trouble, affliction: Dut. *bulderen;* Ger. *poltern*, to make a noise, to rage: Dan. *bulder*, noise, tumult (see POTHER)]: confusion with noise; fuss; bustle; confusion; perplexity: V. to confuse with noise; to annoy; to tease; to perplex. BOTH'ERING, imp. BOTH'ERED, pp. *-ėrd.* BOTH'ERA'TION, n. *-ā'shŭn.*

BOTHIE: see BOTHY.

BOTHNIA, *bŏth'nĭ-a:* name formerly given to a country of n. Europe, along the e. and w. shores of the Gulf of Bothnia (q.v.), the portion now being comprised in Finland (q.v.), and the w. forming the Swedish governments of Pitea and Umea.

BOTHNIA, Gulf of: part of the Baltic Sea, north of the isle of Aland, having on its e. shore Finland, on the w. Sweden and Lapland, with Tornea for its n. limit. It extends from lat. 60° to 66° n., and long. 17° to 25° 35′ e., its greatest length being about 400 m., and its average breadth 100 m. Its depth varies from 20 to 50 fathoms, but both along its shores and in the middle are many small islands, sand-banks, rocks, and cliffs, called *skaers*, which render the navigation difficult; though on the whole it is less dangerous than other parts of the Baltic, and has many good harbors. The rivers which fall into this gulf, both from Sweden and Finland, are numerous; and the waters of the gulf itself are but slightly salt. In winter, it is usually so hard frozen that it can be crossed by sledges.

BOTHRENCHYMA, n. *bŏth-rĕng′kĭm-ă* [Gr. *bothros*, a ditch or furrow; *engchuma*, anything poured in, an infusion]: in *bot.*, dotted or pitted vessels with depressions inside their walls.

BOTHRIOCEPHALUS, *bŏth′rĭ-o-sĕf′al-ŭs* [Gr. *bothrion*, a little pit, and *cephale*, a head]: genus of intestinal worms, belonging to the order of *Cestoid Worms* (q.v.) and included until recently, in the genus *Tænia* (tape-worm, q.v.). The head in this genus is not furnished with four sucking disks, as in the true tape-worms, but with two lateral longitudinal hollows, which seem to serve only for adhesion by means of a partial vacuum; and to have nothing to do with nutrition. Nourishment is indeed supposed to be obtained entirely by the imbibing of fluids through the entire length of the worm; and while this process of imbibing takes place, there is also an exudation—as *exosmose* accompanies *endosmose* (q.v.) in the roots of plants—of peculiar oleaginous drops, which may probably be in part the cause of the injurious effects produced by these worms upon the health of the animals infested by them. The species of B. are very abundant in predaceous fishes, and occur more sparingly in fish-eating birds; the immature and sexless young being found in fishes and inferior aquatic animals, either in peculiar cysts, or in the intestinal canal. Sticklebacks are often seen distended to an unusual size by a species of B. which lies free in the cavity of the abdomen; but in the stickleback its joints and sexual organs always remain undeveloped; it is only when the stickleback has been digested in a bird's stomach, that the B. released, and finding itself at last in suitable circumstances, acquires its mature form, becoming an inhabitant of the bird's intestines. Only one species of B. occurs in man, *B. latus*, which is at once distinguished from the common tape-worm by the different form of its segments, but has been often confounded with another species of tape-worm, under the name of Broad Tape-worm. The segments are much broader than they are long and each contains organs of reproduction. The worm is strictly androgynous. It is scarcely known in Britain, but is of frequent occurrence in some parts of Europe. A coil of these worms is frequently

expelled at once from a patient. The B. is much more easily expelled than the true tape-worms. The same means are employed. The geographical distribution of this worm, which is most frequent in low, marshy countries, has led to the conjecture that its youngest brood may inhabit some of the smallest aquatic animals, and that it may find its way into human beings by their eating salads, fruit which grows near the ground, or the like.

BOTHRODENDRON, n. *bŏth′rō-dĕn′drŏn* [Gr. *bothros*, a pit or cavity; *dendron*, a tree]: in *geol.*, a genus of coal-measure stems with dotted surfaces, and with opposite rows of deep oval concavities; a decorticated condition of ulodendron.

BOTHWELL, *bŏth′wĕl:* small village in Bothwell parish, Lanarkshire Scot., on the right bank of the Clyde, 8 m. e.s.e. of Glasgow. The river is here crossed by the celebrated bridge, the place of the bloody encounter between the Convenanters and Monmouth 1679, when the former were defeated. Near the village are the magnificent Norman ruins of Bothwell Castle, at the foot of which the Clyde washes the fine scenery of 'Bothwell Bank,' celebrated in Scottish song. Pop. 2,500.

BOTHWELL, James Hepburn, Earl of: abt. 1526–78. On his father's death, 1556, he succeeded as fourth earl to the great inheritance which made the Earl of B. the most powerful noble in the s. of Scotland. At first he opposed the Reformation party, but on their accession to power he easily changed his politics, and, 1561, formed one of the deputation of lords sent to convey the youthful Queen of Scotland to her kingdom. He was shortly after made a privy-councilor; but his violence and misconduct soon became intolerable, and he was ordered to quit Edinburgh. In 1562, March, he and the Earl of Arran were committed to the castle for conspiring to seize the queen's person. B. made his escape, was recaptured at Holy Island, again escaped, and sailed to France. He speedily returned, but finding Moray close on his trail, embarked for the continent. Not appearing at his trial, he was outlawed. In 1565, after the queen's marriage with Darnley, he reappeared, and having strongly espoused her cause against Moray and his party, was suddenly restored to favor and even high influence. In 1566, Oct., while performing a judicial tour in Liddesdale, he was attacked and wounded, and the queen manifested her interest in his danger by riding 20 miles and back to see him, a journey which brought on a dangerous fever. At Craigmillar, some time afterward, B. attempted, unsuccessfully, to overrule her objections to a divorce from Darnley. A more thoroughgoing method was open to him, and on the night of 1567, Feb. 9, the house in which Darnley lay sick at the Kirk of Field was blown up with gunpowder. The public voice loudly charged B. with the murder, but he was not formally indicted till Mar. 28. He came to the trial attended by 4,000 followers, and received an easy acquittal. Two days later

he carried the sword of state before the queen at the opening of parliament, and at its close all his lands and offices were confirmed to him, in consideration of his 'gret and manifold gude service done and performit not only to her hienes' honor, weil, and estimatioun, but alsua to the comone weil of the realme and leiges thairof.' At a supper on the following night, the leading nobles signed a bond approving of Bothwell's acquittal, and commending him as a fit husband to the queen, pledging themselves to stand by him. On Apr. 24, B., accompanied by a strong force, carried off the queen to Dunbar Castle; on May 6 he was divorced from his wife, and on the 15th his marriage with Mary was solemnized at Holyrood. He had previously been created Duke of Orkney. His guilty triumph was short; the wrath of the nation was roused, and at the end of one month Mary was a prisoner in Edinburgh, while B. sailing to Orkney, was captured as a pirate by a Danish war-ship and taken to Denmark. He died a prisoner in Draxholm Castle. See *Life* by Schiern, translated from the Danish by Berry (1880).

BOTHY, or BOTHIE, *bŏth'ĭ*, or BOOTHY, or BOOTHIE, *bôth'ĭ* (see BOOTH): originally a humble cottage or hut, but for many years popularly signifying in Scotland a barely furnished, generally uncomfortable habitation for farm-servants, mostly in the e. and n.e. counties. It is usually under the same roof as the stable or at a short distance. The increase of farm cottages is reducing the number of bothies.

BOTONÉ, or BOTTONY, *bŏt'tun-ĭ:* in *her.* a cross of which the ends are in the form of buds or buttons.

BO TREE, *bō'trē:* the name given in Ceylon to the PIPPUL-TREE or PEEPUL (q.v.) of India (*Ficus religiosa*, ord. *Moraceæ*). It is held sacred by the Buddhists, and planted close by every temple, attracting almost as much veneration as the statue of Buddha itself.—The B. T. of the sacred city Anarajapoora, is in all probability the oldest tree in the world of which the age can be ascertained by historical evidence. It was planted B.C. 288, and there are reasons for believing that the tree was then really of the wonderful age of 2,147 years. This tree is invested in the estimation of the Buddhists, with wonderful sanctity. Its leaves are carried away as treasures by pilgrims; but it is too sacred to be touched with a knife and therefore they are gathered only when they fall.

BOTRYCHIUM, *bŏt-rĭch'ĭ-ŭm:* genus of Ferns, of the division *Ophioglosseæ*, having the *spore-cases* (or seed-vessels) distinct, sub-globose, clustered at the margin, and on one side of a pinnated *rachis* (an altered frond), 2-valved, without any trace of an elastic ring, and opening transversely. A n. N. Amer. species is *B. Lunaria*, MOONWORT, a little plant, frequent in dry mountain pastures, but not applied to any particular use. A. species more worthy of notice is *B. Virginicum*, of which the geographical distribution is very remarkable. It abounds in America

in many parts of the southern states, the mountains of Mexico, etc.; in Australia; in some parts of Asia, as the Himalaya Mountains; and is found also in Norway, though in no other part of Europe. It is large and succulent, and is boiled and eaten in the Himalaya, in New Zealand, etc. It is called RATTLESNAKE FERN in some parts of America. There are five other species and varieties in e. United States.

BOTRYOID, *bŏt'rĭ-oyd*, or BOTRYOIDAL, a. *bŏt'rĭ-oy'dăl* [Gr. *botrus*, a bunch of grapes; *eidos*, shape]: resembling a cluster of grapes. BOTRIOLITE, n. *bŏt'rĭ-ō-līt* [Gr. *lithos*, a stone]: a mineral composed chiefly of lime, silica, and boracic acid (Datolite).

BOTRYTIS, *bŏ-trī'tĭs:* genus of Fungi (q.v.) now distributed; some are conidial forms of various Ascomycetes; many are known as Mold (q.v.) and Mildew (q.v.). The name was given from the resemblance of the stalked asexual spores (*conidia*) to grapes in clusters or rows; but all parts of these fungi are so minute as to need the microscope for examination. To the unaided eye the visible parts resemble frost or white powder. The most important in economical respects are the species that affect the silk-worm and the grape-vine, the first assuming after death a white floury appearance (see MUSCARDINE). The *Botrytis infestans* was formerly thought to be the cause of 'the potato rot' (q.v.) but that disease is now believed to be due to *Phytophthora infestens*. These fungi grow in the cells of higher plants, the thread-like mycelium penetrating everywhere, and often sendng bulb-like processes, called *haustoria,* into adjacent cells to drink up the fluids of the host in which the fungus is parasitic. Some infest mostly the under surface of leaves. There are two modes of reproduction in this genus. The asexual is from spores—represented in the figures as terminal on branchlets—borne on mycelial threads (hyphæ) that emerge through the breathing-pores (Stomata—q.v.) usually on the under side of a leaf (see LEAVES). The spores fall, and, alighting on other leaves, send into the tissues a speedily growing filament which branches into a new mycelial network. In some cases however, a spore internally subdivides itself into ciliated zoospores which have locomotion, and work their way in or over the ground, or more directly come in contact with a plant, when they rest and send in a growing filament. The other or sexual reproduction is within the intercellular spaces of the host-plant. Short lateral branches of two kinds are put forth from mycelial filaments; one swells into a spherical *oögonium;* another becomes a club-shaped *antheridium,* which, meeting the first, penetrates it with a fertilizing tube, through which protoplasm is discharged. The oösphere, inclosed in the oögonium, becomes invested with a thick cell-wall, and is able to endure a drought or a winter to renew the species.

BOTS, or BOTTS, n. *bŏts* [Gael. *boiteag*, a maggot; *bouds*,

maggots in barley]: a disease of horses caused by small worms hatched in their intestines from the larvæ of the *bot-fly*. Bott, n. *bŏt*, a belly-worm, especially in horses: see Bot—Bot-fly and Gad-fly.

BOTTA, *bot'â*, Carlo Giuseppe Guglielmo: 1766–1837, Aug. 10; b. S. Giorgio del Canavese, in Piedmont: Italian poet and historian. He studied medicine in Turin. In 1794, he became a physician to the French army, and in 1799, he, Carlo Aurelio de Bossi, and Carlo Giulio, were appointed the provisional government of Piedmont. They were known as *Il triumvirato de tre' Carli*. After the battle of Marengo, he became a member of the Piedmontese Consulta. In the *Corps Legislatif* he gave offense to Napoleon by designating his government as despotic. In 1830 he was allowed to return to his native town, and was pensioned by Charles Albert. He died in Paris. Of his works of earlier date are the following, in which his admirable historic style is gradually developed: *Description de l'Ile de Corfu* (2 vols., Par. 1799); *Souvenirs d'un Voyage en Dalmatie* (Tur. 1802); *Précis Historique de la Maison de Savoie* (Par. 1803); *Historie de l'Amérique* (Par. 1809). His epic poem in twelve books, *Il Camillo o Vejo Conquistata* (Par. 1816), was favorably received. But his most important works are his *Storia d'Italia dal* 1789 *al* 1814 (Par. 1824), which has gone through many editions, and for which he received the quinquennial prize of 1,000 Tuscan dollars, founded by the Grand Duke Ferdinand II., 1814, in the *Accademia della Crusca* at Florence; his *Histoire des Peuples d'Italie* (3 vols., Par. 1825), in which he denies to the Christian religion and to philosophy the credit of having civilized Europe, and ascribes it to the restoration of learning; and the *Storia d'Ilalia dal* 1490 *al* 1814 (20 vols., Par. 1832), which consists of Guicciardini's work (1490–1534), Botta's continuation of it (1535–1789), and the above-mentioned *Storia d'Italia*.

BOTTA, Paul Emile: French archeologist and traveller: 1805–70; son of Carlo Giuseppe Guglielmo B. While young he undertook a voyage round the world, and remained long about the w. coasts of America. In 1830 he entered the service of Mehemet Ali as a physician, and was in the Egyptian expedition to Senaar. The French govt. appointed him consul in Alexandria, and he made a journey in Arabia, whose results he gave in *Relation d'un Voyage dans l'Yemen*, etc. (Par. 1844). Being appointed consular agent to Mosul, B. began, at the instigation of the German orientalist Julius Mohl, a series of discoveries which form an epoch in archæological science. In 1843, B. began his diggings in the heaps of ruins near the Tigris, for monuments of Assyrian antiquity, and his reports, with disquisitions on the cuneiform writing of the Assyrians, are in *Mémoires de l'Ecriture Cunéiforme Assyrienne* (Par. 1848). The French govt. appointed a commission of learned men to conduct the publication of a magnificent

archæological work, published under B's special superintendence, with the title, *Mounment de Ninive, decouvert et decrit par Botta, mesuré et dessiné par Flandin* (Par. 1849–50). In 1848, he published the *Inscriptions découvertes à Khorsabad.* In 1846, B. was appointed consul at Jerusalem, and, 1857, at Tripoli. He returned to France, 1868, and died at Achères, near Poissy. Although in abundance of results B. was far exceeded by Layard (q.v.), yet he certainly laid the foundation of Assyrian archeology. See ASSYRIA.

BOTTA, ANNE CHARLOTTE (LYNCH): author: 1815, Nov. 11—1891, Mar. 23; b. Bennington, Vt. She was educated in Albany, N. Y., and wrote for magazines while quite young. After several years in Providence, R. I., she settled in New York, and married Prof. Vincenzo Botta (q.v.) 1855. She achieved reputation as a writer of poems in a finished style of literary art, including among the best examples, *Paul at Athens, Webster, Books,* and *Wasted Fountains,* while she was specially successful in composing sonnets. Her poems were first collected 1845, and a new edition 1884 finely illustrated. She published also a *Handbook of Universal Literature* (1860), which gained much reputation and became a text-book in educational institutions. Her residence in New York became a prominent social centre for persons eminent in literature and art.

BOTTA, VINCENZO, PH.D.; author: 1818, Nov. 11—1894, Oct. 5; b. Piedmont, Italy. After receiving education in the Univ. of Turin, he was made a prof. in that institution. He came to the United States 1853, and was made prof. of the Italian language and literature in the Univ. of the City of New York. B. published *Dante as Philosopher, Patriot, and Poet* (1865); *A Historical Account of Modern Philosophy in Italy;* and other works.

BOTTEL, or BOTTLE, n. *bŏt'tl* [F. *botel,* diminutive of *botte,* a bunch or bundle: Gael. *boiteal*]: a bundle of hay or grass.

BÖTTGER, or BOTTCHER, *böt'gėr,* or BOTTIGER, *böt'tegėr,* JOHANN FRIEDRICH: 1682–1719, Mar. 13; b. Reuss-Schleiz: improver of the porcelain manufacture. He was apprenticed to an apothecary in Berlin, but became an enthusiast in the search for the philosopher's stone, for which he involved himself in many difficulties. He found patrons at the court of Saxony, and received large sums but as he did not succeed in making old, he was required to reveal his secret in writing. The king, dissatisfied with this production, sought to avail himself of the skill which B. really possessed, with a view to the manufacture of porcelain. B. was compelled, accordingly, to enter upon these experiments, of which the celebrated Meissen Porcelain was the result: see POTTERY. To prevent the revelation of the art he and his assistants were treated as prisoners; and when Saxony was invaded by Charles XII. of Sweden, 1706, they were removed from Dresden to Königstein.

BOTTICELLI,. *bot-e-chĕl'ē,* SANDRO (originally Alessandro Filipepi): 1447–1515; b. Florence: eminent painter of the Tuscan school. He was at first apprenticed to Botticelli, a goldsmith, whose name he assumed; but as he showed genius for painting, he was transferred to the school of Fra Lippo Lippi. In his youth and early manhood, B. felt the spell of classical mythology, and produced many works on classical subjects—the finest his *Birth of Venus,* now at the Uffizi, and his *Venus with the Graces,* now at the Florence Acad. Numerous devotional pictures from his hand exist also, most of them marked by much imaginative refinement. His coloring is rich and fanciful, the light often enriched by gold, and the minutest care is shown in all the details. His flowers, especially his roses, are painted with marvellous delicacy. In the countenances, whether of Madonnas and angels, or of Venuses and Graces, there is a fascinating expression of wistful melancholy. Perhaps B.'s greatest works are the three frescoes, representing the Life of Moses, the Destruction of Korah, Dathan, and Abiram, and the Temptation of Christ, in the Sistine Chapel at the Vatican. He was powerfully impressed by the teaching of Savanarola; and, according to Vasari, his latter years were given to the study of the mystical theology. He seems also to be in part the author of a series of engravings in a primitive style.

BÖTTIGER, *böt'e-gĕr,* KARL AUGUST: 1760, June 8—1835, Nov. 17; b. Reichenbach, Saxony: one of the most erudite and thoughtful archeologists of Germany. He studied at Leipsic. In 1791, chiefly through the influence of Herder, he was appointed director of the gymnasium, and consistorial councilor at Weimar. Here he enjoyed the stimulating society of Schiller, Herder, Wieland, Goethe, and others. His literary activity at this period was prodigious. He edited several journals and wrote multitudes of reviews, biographical notices, etc., for the *Allgemeine Zeitung.* In 1804 B. was called to Dresden, where he began to deliver lectures on special branches of classical antiquities and art. The result of these was: *Discourses on Archæology* (Dresden, 1807); *On Museums and Collections of Antiques* (Leip. 1808); *The Aldobrandinian Marriage Festival* (a mythico-allegorical interpretation of a picture discovered by a member of the Florentine family of Aldobrandini, representing a Roman marriage (Dresden, 1810); *Thoughts on the Archæology of Painting* (Dresden, 1811); and the *Mythology of Art* (Dresden, 1811). In 1814 appeared his *Lectures on the Dresden Gallery of Antiques* (Dresden); in 1821–25, his *Amalthea,* or *Museum of Mythological Art,* etc. (Leip.); and in 1826, his *Thoughts on Mythological Art* (Dresden and Leipsic). In 1832 B. was elected a member of the French Institute. His works, both in Latin and in German, have been collected and edited by Sillig.

BOTTLE, n. *bŏt'tl* [F. *bouteille,* a bottle, a bubble—from

botte, a bunch: mid. L. *butĭc′ŭlă,* a kind of water-vessel—from L. *butĭca;* Gr. *butis,* a flask: It. *bottiglia*]: a vessel with a narrow neck for holding liquids; the quantity contained: V. to shut up into a bottle. Bottles are now usually made of glass or earthenware (see GLASS); but the first bottles were made of the skins of animals, mostly goats. Of this kind were the bottles spoken of in Scripture. Skin bottles are still used in s. Europe for wine, and by tribes of Africa and Asia for water. The ancient Egyptians made bottles of most elegant form and exquisite workmanship of alabaster, stone, gold, ivory, and other substances. The Italian peasants carry, slung round their necks, bottles made of the rind of the gourd, which, when dry, is as hard as wood. BOTTLING, imp. *bŏt′lĭng:* N. the operation of putting into bottles, as a liquor. BOTTLED, pp. *bŏt′tld:* ADJ. that is put in bottles; in *OE.,* having a protuberant belly. BOTTLE-HEAD, a sort of whale. BOTTLE-NOSED, with a nose full and swollen at the end BOTTLE-HOLDER, one who administers refreshment to a combatant; a backer; a second—usually in a prize-fight.

BOT′TLE CHART: chart purporting to show the track of bottles containing papers, sealed, and thrown from ships into the sea, in the hope that these fragile messengers may be picked up, and their intelligence reach its proper destination. Lieut. Becher, English naval officer, constructed, 1843, a chart of bottle-voyagers in the Atlantic, his facts being drawn from the numerous cases that had occurred. The time which elapses between the casting of the bottle from the ship and the finding it on shore, or picking up by some other ship, has varied from a few days to 16 years; while the straight-line distance between the two points has varied from a few miles to 5,000 m. The Bottle Chart has been re-edited and re-engraved from time to time, and published in the *Nautical Magazine;* it is marked by several hundred straight lines, each drawn from the lat. and long. of the start to the lat. and long. of the finding. Recently, several government departments, especially the U. S. Hydrographic Office, have used this method systematically for the study of ocean currents. The bottles sent out by U. S. office contain papers requesting their return to the nearest U. S. consul with date and circumstances of finding. In this way 300–400 new bottle voyages have been registered, in general the tracks of different bottles are remarkably uniform given the same local conditions.

BOTTLE-FLOWER: the *Centaurea cyanus.*

BOT′TLE GLASS: see GLASS.

BOT′TLE-GOURD (*Lagenaria,* from Lat. *lagena,* a bottle): genus of plants of the nat. ord. *Cucurbitaceæ* (q.v.), nearly allied to the Gourd (q.v.) genus (*Cucurbita*), in which it was until recently included. One of the most marked distinctions between them is the very tumid border of the seeds of the Bottle-gourds, which have also all the anthers separate, and have white flowers, while those of the Gourds

proper are yellow. The common B., or False Calabash (*Lagenaria vulgaris*), native of India, is now common almost everywhere in warm climates. It is a climbing, musky-scented annual, clothed with a soft down, having its flowers in clusters, and a large fruit from 1 ft. to even 6 ft. in length, usually shaped like a bottle, an urn, or a club. The fruit has a hard rind, and when the pulp is removed, and the rind dried, it is used in many countries for holding water, and is generally called a *calabash* (q.v.). The B., in its wild state, is very bitter and poisonous, and even in cultivation some of its varieties exhibit not a little of the bitterness and purgative properties of colocynth (q.v.). Other varieties, however, have a cooling edible pulp—in general those which attain the greatest luxuriance. The B. appears to have been introduced into Europe about the close of the 16th c., but requires for advantageous cultivation a warmer climate than that of any part of Britain. It is cultivated in the southern part of the U. S., and less frequently in the north. It is much cultivated in warmer countries as an esculent, and is an important article of food to the poorer Arabs, who boil it with vinegar, or make a pudding of it in its own rind with rice and meat.

Another species, *L. idololatrica*, is a sacred plant of the Hindus, much employed in their religious ceremonies.

BOTTLE'HEAD (synon. *Bottlenose Bottleheaded Whale, Bottle-nosed Whale, Beaked Whale, Sperm-whale Porpoise*): cetaceous animal (*Hypeoödon rostratus*) of family *Ziphiidæ*, intermediate between sperm-whales and dolphins, and differing noticeably from the latter in having very few teeth developed, if any, instead of very many; the dorsal fin short, of five digits included in the skin. *H. rostratus* has been described under many synonyms, such as *bidens, semijunctus, butzkopf*, etc., and sometimes confounded with the Bottle-nose Dolphin (*Tursiops tursio*), of similar range in the n. Atlantic, and common especially at Cape May. It differs from genera in its own family, such as *Mesoplodon*, the Cow-fish, in having a longer beak and the teeth concealed (not referring here to the Cow-fish (*Grampus*) of the Dolphin family). The beak though longer, is comparatively short; the forehead rises suddenly from the beak and is remarkably elevated, a peculiarity due to large, bony crests rising over the bones of the upper jaw. The teeth are only two in number, in the fore part of the lower jaw, pointed, but much enveloped by the soft parts, and sometimes completely hidden among them: the palate and upper jaw are furnished with little hard points or tubercles, not $\frac{1}{10}$ of an inch in height, which, however, have been doubtfully regarded as a kind of false teeth, and by Cuvier as rudimentary vestiges of whalebone. There is a dorsal fin rather small in proportion to the size of the animal, and placed further back than in the common dolphin. The blowhole is crescent-shaped, the points of the crescent directed backward. The skin is smooth and glossy, of a blackish lead color on the back,

gradually becoming lighter on the sides and whitish on the belly. The animal attains a length of about 25 ft.

The name BOTTLE-NOSED WHALE has been given also to a species of dolphin (q.v.).

BOTTOM, n. *bŏt'tŏm* [AS. *botm;* Dut. *bodem;* Ger. *boden;* Icel. *botn,* the lowest part. F. *bout,* that part of a body which touches or pushes first], the lowest part of anything; the foundation or base; that on which anything rests; the deepest part of a subject; the lowest part of a declivity; the low land formed by alluvial deposits along a river, a dale, a valley; the end; natural strength; a ship, so named from its bottom or shell. V. to found or build upon; to rest upon as a support. BOT'TOMING, imp. BOT'TOMED, pp. *-tŏmd:* ADJ. having a bottom or basis. BOT'TOMLESS, a. without a bottom: very deep. AT BOTTOM, in reality. ON ONE'S OWN BOTTOM, independent or independently. BOT'TOMRY, n. *-rĭ,* money borrowed on the security of the bottom of a ship—that is, of the ship itself BOT'TOMS, n. plu. the deepest working parts of a mine.

BOTTOM, n. *bŏt'tŏm* [W. *botwm,* a button—from *bot,* a round body]: a ball of thread wound up; a cocoon.

BOT'TOM, in Naval Language: either the whole ship itself, or that part of it under water when laden Commodities are often said to be imported 'in foreign bottoms,' or in 'American bottoms,' in which cases the phrase is applied to the whole ship. A 'full ship,' or a 'full B.,' denotes such a form given to the lower half of the hull as to allow the stowage of a large amount of merchandise. A 'sharp ship,' or a 'sharp B.,' implies a capacity for speed.

BOTTOM-GLADE: a glade in the lower part of a valley; a dale.

BOT'TOMRY, BOND OR CONTRACT OF: a security by which a ship itself is expressly mortgaged and pledged by the owner or master, or *hypothecated* for repairs to the ship, or for money advanced for its outfit, or otherwise with relation to it. It is called a security by *B.*, because the bottom or keel of the ship is figuratively used to express the whole of it. The loan or debt is repayable only in the event of the ship's safe arrival at the port or destination; and in consideration of this risk the lender or creditor exacts a premium, the amount of which depends on the nature of the adventure. If the ship be totally lost the lender loses his money; but if she returns safely he recovers his principal, together with interest at the rate agreed upon. These contracts are not treated as ordinary mortgages, and preferred according to the order of date; but inversely the latest is preferred to the preceding, because it is presumed that the last loan saved the ship, and in all cases necessity alone is the condition of the contract. The seamen's lien for wages has priority to that of the holder of a B., and owners are also personally liable for the wages of seamen. When the holder of a B. is obliged to pay the seamen's lien he is entitled to

compensation from the owners and has a lien upon the proceeds of the vessel for his reimbursement. A B. usually provides that in case of damage to a vessel, not amounting to a total loss, the lender shall bear his proportional share of the loss. See RESPONDENTIA: MERCHANT SHIPPING ACT.

BOTTONY, n. *bŏt'tŏn-ĭ* [OF. *botoné*, furnished with buttons or buds]: a bud-like projection, of which in general three are together. They may be seen in the cross bottony, which is a cross, each of the four extremities of which terminates in three bud-like prominences. They present a certain remote resemblance to the leaf of a trefoil plant.

BOTTS, *bŏts*, JOHN MINOR: 1802–69; b. Va.: lawyer and politician. He was elected to the legislature of his state, 1833, and serveral times later; became member of congress, 1839, and took sides with Henry Clay in favor of the tariff and the distribution of the public domains. When Tyler left the party that had raised him to the presidency, B. abandoned him, although he had been for a long time a personal friend. During the civil war he remained faithful to the Union; and afterward was one of the signers of Jefferson Davis's bail-bond. He is author of *The Great Rebellion; its Secret History.*

BOTULIFORM, a. *bŏt'ūl-ĭ-fawrm* [L. *botulus*, a sausage; *forma*, form, shape]: sausage-shaped.

BOTZEN, or BOZEN, *bŏt'sĕn* (Ital. BOLZANO): important trading town of the Austrian Tyrol, about 32 m. n.n.e. of Trent. B. is well built, with good streets and arcades, and streams of pure water are conducted through the principal thoroughfares in little canals. It is protected from the inundations of a mountain-torrent in the vicinity by a strong wall about two m. in length. Its situation on the Brenner railway and at the junction of the roads from Germany, Italy, and Switzerland, makes it an important entrepôt. It has manufactures of silk, linen, hosiery, leather, etc., and four extensive annual fairs. Wine and fruits in abundance are produced in the environs. Pop. 13,600.

BOUCH, v. *bûsh* [F. *bouche*, mouth, entrance—from L. *bucca*, the cheek, the mouth: Gael. *bus*, a mouth]: to make a mouth into; to drill a new vent in a gun which has been spiked: N. the piece sloped out of the upper part of a shield of the fifteenth and sixteenth centuries, to allow the lance free motion. BOUCH'ING, imp. BOUCHED, pp. *bûsht*.

BOUCHAIN, *bô-shăng'*: fortified town of France, dept. of Nord, 12 m. s.e. of Douai, intersected by the Scheldt and possessing the means of laying the adjacent country under water in the event of an attack. It was taken by the Duke of Marlborough, 1711, and recaptured by the French in the following year, to whom it was finally ceded by the treaty of Utrecht. The chief business is extracting sugar from beet-root, and refining salt. Pop. abt. 2,000.

BOUCHER, *bô-shā′*, Francis: 1704–70; b. Paris: painter After studying there under Francis le Moine, he went to Rome to prosecute his art. After a short residence there he returned to Paris, and, on the death of Vanloo, was appointed principal painter to Louis XV. B. was equally facile in the production of figure or of landscape pictures —a facility fatal to the claims that his genius might otherwise have had on posterity. In many of his paintings picturesque effect is the only thing sought, at whatever cost to truth. He has been called the Anacreon of painting on account of the amorous character of many of his works; mythological and pastoral subjects were also great favorites with him. At his death he was director of the French Acad.

BOUCHER, Pierre (Sieur de Boucherville): 1622–1717; b. France; d. Canada: historian, pioneer, and Huron interpreter, who came to Canada (then called New France) 1635. In 1661 the colony sent him to France as deputy, and soon afterward he published his *History of New France, Histoire véritable et naturelle des mœurs et productions de la Nouvelle-France* (Paris, 1665, 12mo.). He was appointed gov. of Three Rivers. B. was an exemplary man, the ancestor of some of the best families in Canada. A short time before his death he addressed to his children *The Adieus of Grandfather Boucher.*

BOUCHES-DU-RHONE, *bôsh-dü-rōn′:* department in the s.e. of France, formerly a part of Provence; at the mouths of the Rhone, lat. 43° 10′—43° 56′ n., and long. 4° 13′—5° 40′ e.; 1,970 sq. m. It is divided into three arrondissements—Marseille, Aix, and Arles—which are subdivided into 29 cantons and 109 communes. Through the n. and e. districts, the Maritime Alps, which send out some calcareous ridges southward, slope gently down to the basin of the Rhone. Toward the sea-shore, there are several plains of considerable extent. About one-half of the department is under cultivation; heaths, wood, wastes, and water occupy the other half. Marble, limestone, and gypsum are found in the Bouches-du-Rhone. Leather, hats, perfumes, soap, olive-oil, vinegar, and chemical products are manufactured; there are extensive brandy-distilleries, sugar-refineries, and salt-works, and the produce of wine is large. B. has an active commerce with the Levant, Africa, Spain, and the W. Indies. Pop. 734,-350.

BOUCHETTE, *bô-shĕt′*, Joseph: Canadian topographer: 1774–1841, Apr. 9: b. Canada; son of Com. B. At the age of 16 he entered the office of his uncle, the Brit. N. Amer. surveyor-gen., whom he succeeded in office 1804. In the war of 1812 he served against the United States. He was engaged 1817–8 in establishing the line between the Brit. possessions and the United States. His topog. and geog. description of Canada was published, London 1816. He pub. also *The British Dominions of North America* (1831) descriptive and statistical; *Topographical Dictionary of Lower Canada* (1832).

BOUCICAULT, *bō′ sē-kō*, DION: British playwright: 1822, Dec. 26—1890, Sep. 18; b. Dublin, Ireland. He was educated for an architect and civil engineer; but turned to dramatic writing, and at the age of 19 produced, in connection with John Brougham, *London Assurance*, which was acted at Covent Garden, London. The play had great popularity. He married Agnes Robertson, and 1853–60 lived in the United States. Returning to London, he produced at the Adelphi Theatre 1860 his first Irish play, *The Colleen Bawn*, which gained immediate fame and still holds the stage; also 1861 *The Octoroon*, strongly depicting the evils of American slavery. More than 100 dramas rapidly followed from his prolific pen, among which were *Relief of Lucknow* (1863); *Streets of London* (1865); *Arrah-na-pogue* (1865), in which B. appeared as Shaun in Booth's Theatre, New York, 1872; *Rip van Winkle* (1865), made famous by Joseph Jefferson's acting; *The Flying Scud* (1866); *Hunted Down* (1866); *Foul Play* (1867) in collaboration with Charles Reade; *After Dark* (1868); *Formosa* (1869); *Daddy O'Dowd*, Irish play, acted 1873 at Booth's Theatre; *Mora and Mimi*, acted 1873 at Wallack's; *The Shaughraun*, acted 1876 at Wallack's, one of the most successful of his plays. A leading American critic has characterized B's plays as original, not in plot, but in general treatment, including action and incident, and as singularly bright in dialogue. He had a skilful dramatic judgment. He married 1889 a young Amer. actress, Louisa Thorndyke, though the validity of his divorce from his former wife was questioned.

BOUDINOT, *bō′ de-not*, ELIAS: 1740–1821; b. Philadelphia: patriot and philanthropist; great-grandson of Elias B., a French Huguenot who fled to America after the revocation of the edict of Nantes. He was a successful lawyer, and one of the first advocates of colonial liberty. Congress appointed him commissary-gen. of the prisoners in 1777, and the same year he was elected member of congress. He became pres. of that body, 1782, and as such signed the treaty of peace, 1783. In 1796 Washington appointed him superintendent of the mint. He resigned 1805, and resided after that at Burlington, N. J. In 1816 he became the first pres. of the American Bible Soc. He gave 16,000 acres of land and large sums of money to charitable institutions. He wrote a number of works. The principal are: *Age of Revolution; or, The Age of Reason an Age of Infidelity*, a reply to Paine (1790); *Star in the West; or, An Attempt to Discover the Long-lost Tribes of Israel* (1816), pointing to the Indians as the lost tribes.

BOUDINOT, ELIAS (the Cherokee): d. 1839, June 10; one of three Cherokee youths brought by missionaries to a school in Cornwall, Conn., 1818. Elias Boudinot, the philanthropist, who took an interest in the education of the Indians, allowed one of those boys to adopt his name. He afterward became a leading man in his tribe.

BOUDOIR, n. *bûd′ wŏr* [F. *boudoir*—from *bouder*, to pout, to sulk—*lit.*, a place to sulk in]: a lady's small private apartment, such as a dressing-room, in which she receives only her most intimate friends. Boudoirs as

rooms to which numerous friends were admitted at early hours—almost after the manner of a public reception—became fashionable in France during the reign of Louis XIV., and so continued during the following reign. The example having been set by Madame Pompadour, Madame Dubarri, and other royal mistresses, it became indispensable for every lady of fashion to have her B., which was adorned with the most fantastic luxuriousness.

BOUFARIK, *bo͞o-fâ-rēk':* village of Algeria, province of Algiers, 16 m. s. of Algiers; important military station on the road from Algiers to Blidah and Oran. It has well-frequented markets, and a considerable trade in corn, cot ton, olives, oranges, tobacco, raisins, and cattle. Pop. 8,000.

BOUFLERS, *bo͞o-flâr':* Louis François, Duke of, peer and marshal of France: 1644–1711; descended from one of the most ancient and noble families of Picardy; distinguished general. He began his military career as a lieut., and rose very rapidly in rank. Under the great Condé, Turenne, Crequi, Luxembourg, and Catinat, he fought with distinction in Germany and the Netherlands. His defenses of Namur 1695 and of Lille 1708, are famous. The seige of the former place, conducted by King William III. of England, cost the allies more than 20,000 men; and although Louis XIV. sent to B. an order written by his own hand for the surrender of the place, yet he did not surrender it until all the means of defense were exhausted. After the defeat of Malplaquet he led the French army so admirably that the retreat seemed rather a triumph than the consequence of a lost battle. He was a man of highly honorable and upright character. He died at Fontainebleau.

His son, Joseph Marie, Duke of Bouflers, Marshal of France, 1706–47, d. at Genoa.

BOUFLERS, Stanislas, Marquis de, commonly styled the Chevalier de Bouflers: 1737–1815, Jan. 18; b. Luneville, France; son of the Marquis Bouflers-Remiencourt, who was captain of the guard to Stanislas, King of Poland, and his mother was long one of the brightest ornaments of the Polish court. He entered the French military service, and was very soon made gov. of Senegal, in which capacity he introduced many regulations very useful to the colony. After his return, he applied himself to the light literature of the time of Louis XV. He was chosen a member of the national assembly 1789, in which he showed great moderation; but after 1792, Aug. 10, he forsook France, was hospitably received at the court of Prussia, and received the gift of a large estate in Poland, in order to establish upon it a colony of French exiles. Having returned to France, he again gave his attention, after the year 1800, entirely to literature. In 1804, he entered as an old academician into the Institute reorganized by Napoleon. The monument on his grave bears this inscription, dictated by himself: *Mes amis, croyez que je dors* (My friends, believe that I sleep). A collection of his works

was published after his death (8 vols. Par. 1815). His letters from Switzerland are especially noticeable; from this work an idea may be formed of the amiable character and intellectual liveliness of its author.

BOUGAINVILLE, *bô-găng vēl'*, Louis Antoine de: 1729 Nov. 11—1811, Aug. 31; b. Paris, son of a notary; famous French navigator. He studied in Paris and attained great proficiency in languages and science. In 1754, he went as sec. of the French embassy to London. In 1756, he acted as aide-de-camp to the Marquis of Montcalm, to whom the defense of Canada was intrusted. At the head of a select detachment he burned an English flotilla; and through his advice and example a corps of 5,000 French, 1758, June, successfully withstood an English army of 24,000. In the campaign of 1761, in Germany, he served with distinction. After the peace he entered the naval service, in which he soon signalized himself. After having been obliged to give up a project of founding a settlement on the Falkland Islands he undertook a voyage round the world (1766, Dec. 15—1769, March 16) with a frigate and a St. Malo transport, the first voyage round the world which the French ever accomplished. He gave an account of it in his *Description d'un Voyage autour du Monde* (2 vols., Par. 1771–2). Geography and other branches of science were enriched by it with many discoveries. In the North American war, B. commanded several ships of the line, and in 1779, was made *chef d'escadre;* in the following year he was made a field-marshal in the army. After the outbreak of the Revolution he retired from public service, and engaged entirely in scientific pursuits.

BOUGAINVILLEA, *bô'găn-vil-lē-a:* plant of the order *Nyctaginaceæ*, largely cultivated in greenhouses for the beauty of its purple bracts; the name is also used of a genus of hydroid zoophytes.

BOUGAINVILLE BAY, named—as were also the island, the strait, and the plant—from the French navigator Bougainville (q.v.), a contemporary of Cook. It is in Patagonia, on the n. side of the Strait of Magellan, lat. 53° 25′ s., long. 70° 13′ w.

BOUGAINVILLE ISLAND: one of the Solomons, in the w. section of Polynesia, sometimes distinguished from the e. section as Melanesia. B. is between lat. 5° 30′ and 7° 2′ s., and in long. 155° e.; mountainous, well wooded, and populous.

BOUGAINVILLE STRAIT: in the New Hebrides, between Mallicollo and Espiritu Santo.

BOUGH, n. *bow* [AS. *bog*—from *bugan*, to bend: Icel. *bogr*, the shoulder of an animal]: a branch or arm of a tree.

BOUGHT, *bawt:* pt. of Buy, which see.

BOUGHT, n. *bowt* [AS. *bugan*, to bow or bend: Dan. *bugt*, a bend, a turn, a bay (see Bout)]: the separate folds of a rope when coiled in a circle; a twist; a link; the part of a sling which contains the stone.

BOUGHT AND SOLD NOTES are notes of sale signed by a broker employed to sell goods, and by which the bargain through him is completed. See BROKER: SALE OF GOODS: also PAROLE EVIDENCE.

BOUGHTON, *boiw'tun*, GEORGE HENRY: artist: b. Norfolk, England, 1833; d, London 1905, Jan. 19. When about 3 years of age, his parents brought him to Albany, N. Y. In his spare moments he made pen-and-ink sketches, and attempted painting on canvas. With the money obtained from the sale of some paintings, 1853, he went to London, where he studied for a few months, after which he returned to Albany; but soon removed to New York, where he gave special attention to landscape-painting. He studied in Paris 1859–61, and in the latter year removed to London. He was elected a member of the National Acad. in New York 1871, an associate of the Royal Acad., London, 1879, becoming a member in 1896. His best pictures were *The Idyl of the Birds; Hay-Harvest in Brittany; The Scarlet Letter; Wayside Devotion; Puritans Going to Church; Snow in Spring;* and *The Return of the Mayflower.*

BOUGIE, n. *bô'zhē* [F. *bougie*, a wax-candle—so named from the town *Bougie* in Algeria]: a wax-taper; a long slender instrument, made of elastic gum, wax, or metal, for removing obstructions in the bladder, and for distending contracted mucous canals, such as the gullet, bowels or urethra: see STRICTURE. For the urethra they are generally of German silver or rubber, and vary from .125 to .25 inch in diameter. Larger sizes are used in some cases.

BOUGUER, *bô gā*, PIERRE: 1698, Feb. 16—1758; b. Croisic, Bretagne: French mathematician and natural philosopher. He studied in the Jesuit College at Vannes. In 1713, he succeeded his father as prof. of hydrography in Croisic, from which he was removed to a similar office at Havre 1730. In 1729, he published his *Essai d'Optique sur la Gradation de la Lumière.* In 1731, he was made associate geometer of the Acad. of Sciences, and promoted to the office of pensioned astronomer 1735. In that year, also, he was chosen to go with Godin and De la Condamine, to S. America for the measurement of a degree of the meridian at the equator. B. and his companions met many difficulties, and were absent more than seven years, during which time B. made valuable observations on the length of the second's pendulum at great elevations, the deviation of the plumb-line from a vertical position through the attraction of a neighboring mountain, the limit of perpetual snow, the obliquity of the ecliptic, etc. He published an account of his labors and those of his colleagues in a magnificent work, *La Figure de la Terre déterminée par MM. Bouguer et De la Condamine* (Par. 1749). B.'s investigations concerning the intensity of light laid the foundation of photometry; and their results, partly exhibited in the optical work already noticed, were more fully embodied in his *Traité d' Optique sur la Gradation de la Lumière,* edited after his death by Lacaille (Par. 1760).

He invented the heliometer in 1748, which has of late been brought to greater perfection by Fraunhofer. He published an excellent work on navigation (Par. 1753).

BOUGUEREAU, *bô-grō*, GUILLAUME ADOLPHE, artist painter: 1835, Nov. 30—1905, Aug. 20; b. La Rochelle, France. While employed in a mercantile house at Bordeaux, he studied drawing two hours a day, and at the end of the first year won the highest prize. This success led him to adopt painting as a profession. First he entered the studio of Picot in Paris, and later became a pupil in the School of Fine Art. He visited Rome 1850. In the fine art exposition of 1854 he had a painting, *Body of St. Cecelia Borne to the Catacombs*, and after that time he held rank among the best painters of France. Among his works are: *Philomela and Procne; Vierge Consolatrice; Harvest Time; Homer and His Guide; Youth of Bacchus; The Scourging of Our Lord.*

BOUILLÉ, *bô-yā′*, FRANÇOIS CLAUDE AMOUR, Marquis DE, general in the French army: 1739–1800; b. at the castle of Cluzel, in Auvergne. He entered the army at the age of 14 and served in Germany during the Seven Years' War. In 1768, he was appointed gov. of the island of Guadeloupe, and afterward gov.gen. of Martinique and St. Lucia, and commander-in-chief of all the French forces in the W. Indies, capturing Dominica and other important islands from the British 1778–82. His humanity and generosity were equal to his valor and skill. He received the rank of lieut.gen. 1782. In 1784, he visited England, and was received with extraordinary respect. In 1790, he was made commander-in-chief of the army of the Meuse, the Saar, and the Moselle. His decision of character prevented the dissolution of the army and the outbreak of civil war. For his share in the attempted escape of Louis XVI. he had to flee from France and went to Coblenz to the King's brothers; and in 1791 entered the service of Gustavus III. of Sweden, and after the assassination of that monarch he served in the corps of the Prince of Condé. Rejecting the chief command in La Vendée, proposed to him by the French princes 1793, he went to England, where he wrote *Mémoires sur la Révolution Francaise*—a truthful and useful work. He died in London.

BOUILLI, n. *bôl′yē* [F.—from *bouillir*, to boil—from L. *bullīrĕ*, to bubble]: meat boiled or stewed with vegetables. BOUILLION, n. *bôl′yŏng*, soup; broth; a disease in horses consisting of a fleshy excrescence on the heel.

BOUILLON, *bôl-yōng′* or *bô-yōng′:* a duchy, originally German, in the Belgian part of the grand duchy of Luxemburg, consisting of a woody and hilly district in the Ardennes, about 157 sq. m. This duchy was the possession of the famous crusader, Godfrey (q.v.) of Boullion, who, in order to raise money for his crusade, pledged it, in 1095, to the Bishop of Liege. It was conquered by France in the war of 1672, and bestowed by Louis XIV., 1678, upon his grand chamberlain, Latour d'Auvergne.

By the peace of 1814 the greater part of it was included in the grand duchy of Luxemburg; and the sovereignty of it passed to the king of the Netherlands, who, 1821, purchased the proprietary rights from the heir. By the revolution of 1830, B., with Luxemburg, was separated from the Netherlands, and in 1837 united to Belgium. Pop. 21,000.

The principal town is Bouillon, between steep hills on the Semoy, with a strong castle on a rock, formerly the residence of the Dukes of Bouillon. Pop. 2,500.

BOUILLON, GODFREY: see GODFREY OF BOUILLON.

BOUILLY, *bô-yē*, JEAN NICOLAS: 1763–1842, April 24; b. Boudray, near Tours; prolific French dramatic writer. He was a strong partisan of the Revolution 1790; but afterward, in public office, showed moderation. He was active in introducing elementary schools in France.

BOULAC, or BOOLAK, *bô-lâk′*: the port of Cairo, on the Nile, about one m. from Cairo, and is supposed the site of the ancient Litopolis. It is a crowded town, extremely dirty, with very narrow and irregular unpaved streets. It contains the custom-house and warehouses of Cairo, cotton, paper, and sugar factories, a printing press, and the famous museum of antiquities of the Nile land. Pop. abt. 10,000.

BOULAINVILLIERS, *bô-lăng-vē-yā*, HENRY, Count: 1658, Oct. 11—1722, Jan. 23; b. St. Saire, Normandy: French author, descended from an ancient family in Picardy. He regarded the feudal system as the most perfect creation of human wisdom, and his writings are amusing by their extreme aristocratic sentiments.

BOULANGER, *bô-lŏng-zhā′*, GEORGES ERNEST, JEAN MARIE: 1837 Apr. 29—1891, Sep. 30; b. Rennes, France: soldier. He was educated at St. Cyr; served in the Kabyle Expedition, the war with Italy, and the expedition to Cochin China; was chief of battalion in the Franco German war; was head of the French delegation to the American centennial celebration; served two years in Africa; was promoted gen. of div. 1884; and was appointed minister of war, 1886, Jan. 7. He aided in procuring the expulsion of the Orleans princes from France; inaugurated many reforms in the army; went out of office with De Freycinet's cabinet; was court-martialled and placed on the retired list of the army 1888 for violation of milit. discipline, and the same year was elected to the chamber of deputies. Here he advocated radical changes in the constitution, and was censured for denouncing the ministry. He provoked Premier Floquet to challenge him to a duel 1888, July, and was severely wounded. He fled to Brussels 1889, Apr. 1; was tried and convicted (in contumacy) by the French senate on charges of high treason, conspiracy, embezzlement, and official corruption, in Aug., made his headquarters for some time on the island of Jersey; and killed himself in a cemetery near Brussels.

BOULAY DE LA MEURTHE, *bô-lā′dėh lâ-mėrt*, Antoine Jacques Claude Joseph, Count: 1761–1840, Feb. 2; b. Chaumousey, France: statesman. He opposed the Jacobites and the Directory in the Council of Five Hundred; was pres. of the legislative section of the council of state under the empire; was taken to Germany by the Russians after the second restoration; and returning to Paris 1819, lived in retirement till his death. He adhered faithfully to the cause of Napoleon, and was created a count of the empire. His publications include: *Essay on the Causes Which Led to the Establishment of the Commonwealth in England* (1799); *Political Picture of the Reigns of Charles II. and James II.* (1818).

BOULDER, *bōl′der*, city: cap. of Boulder co., Col. near the e. base of the Rocky Mts., 30 m. n.w. of Denver; at junction of several branches of the Union Pacific r.r. It is a central point for a rich mining region of gold, silver, iron, and coal; has excellent schools, the state univ., public library, extensive public park, fine water supply, and electric lights. Pop. (1910) 9,539.

BOULDER, or Bowlder, [Dut. *bolle*, a globe: F. *boule*, a ball or sphere of wood, metal, etc.: Icel. *bolr*, the round trunk of a tree: prov. Sw. *bullersten*, the larger kind of pebbles: L. *bulla*, any small round body]: in *geol.*, a rounded or water-worn block of stone found embedded in the clays and gravels of the drift formation; the rounded stones found on the surface of the earth, or on the seashore.—*Erratic Boulders* are large masses of rock found at a distance from the formations to which they belong. The term is generally applied when they are found lying detached on the surface; in which case they may have been washed out of the Boulder-clay (q.v.) or carried separately by glaciers, and dropped. Large blocks of Scandinavian rocks are found scattered over the plains of Denmark and n. Germany, and frequently are striking features in the landscape. The pedestal of the statue of Peter the Great in St. Petersburg was hewn out of a large erratic boulder, 1,500 tons in weight, from a plain near by. A large one forms a rocking-stone at Fall River, Mass.

BOULDER-CLAY, or Dilu′vium, or Drift, or Till: post-pliocene bed of a remarkable character, but no longer of a mysterious history. It occurs usually as the lowest or first of that group of beds which geologists recognize as the post-tertiary, post-pliocene, and recent, now called quaternary. The only exception is when a bed of sand intervenes—as is rarely the case—over the surface of the subjacent rocks. It consists of a compact clay, blue or red, according to the prevalent character of the subjacent rocks, having boulders diffused throughout its mass, and with here and there thin lenticular beds of gravel and sand interspersed. In some places in Scotland it is not less than 70 ft. thick. In America, it extends to about the 38th parallel; in Britain, it terminates a little n. of London. The boulders, the most striking feature of this bed, differ in

size from a small pebble to masses many tons in weight. They are portions of rocks of all ages, more or less worn. The older rocks, when from a distance, are rounded, while those that have been broken from rocks in the district are more angular. These masses are scattered without order in the clay, the heaviest blocks occurring frequently in the upper portion of the bed. Nor is there any indication of their having sunk in the clay from gravity—the clay seems to have been so viscid when the materials assumed their present position, as to have successfully resisted the immense pressure of these enormous blocks. The boulders have not that rounded appearance produced by the action of water in a river-course or on the shore between high and low water marks. They have a greater or less number of *rubbed faces*, produced evidently by being forced, while held in one position, over the solid rocks beneath. The rubbed and scratched surfaces exhibited on these rocks, when the superincumbent clay is removed, plainly testify to their origin. Several interesting examples of such rubbed surfaces are in the neighborhood of Edinburgh. A careful observer can determine from the scratchings the direction of the current which bore with it the rubbing boulders. In the district to which we have alluded, these indicate a current from the west. The general direction, however, in America, in Britain, and in Scandinavia, seems to have been from the poles towards the warmer regions of the earth.

The B. contains no fossils strictly its own. Organisms exist in the boulders obtained from the older fossiliferous rocks, but no indications have hitherto been observed of a fauna or flora belonging to the period of the deposition of this bed. In the brick clays and gravels overlying it in Scotland are shells of arctic character.

The origin and structure of this remarkable bed have been a puzzle to geologists. That it was produced by the Noachian deluge, as was universally believed not many years ago (whence its former name *Diluvium*), finds now no supporters. The present approved explanation assigns it to the action of great glaciers that covered much of the northern hemisphere, the age ending 5,000–7,000 years ago, according to recent calculations based on the recession of Niagara Falls and other data. The boulder-clay was the finer detritus from the grinding of the glaciers, and the planed boulders frozen into the ice beneath, while immense quantities of rock, gravel, and sand were borne on the surface or in the body of the glacier. See GLACIER.

BOULEVARD, or BOULEVART, n. *bôl-vâr'* [F. *Boulevard;* Ger. *bollwerk*, a bulwark or rampart—from Dut. *bolle*, a bend: Dan. *bull*, the trunk of a tree: Ger. *bohle*, a plank; *werk*, work, defense (see BULWARK)]: the principal palisaded defense or fortification around a town or village; the rampart of a fortification; a public promenade planted with trees, often occupying the site of the old ramparts of a town. In France and Germany these ancient works

have generally been levelled, the ditches filled up, and the space thus obtained employed for parks, promenades, and streets lined with trees; which in France still bear the name of B. Thence in some other countries, notably the United States, the term B. has come to be applied loosely to a broad, prominent street, especially if raised on an embankment. The boulevards of Paris are celebrated, and are of great service as open spaces promoting the circulation of air amid the dense mass of habitations. Some parts of them present a very dazzling spectacle, and as a whole they afford a striking exhibition of the life and character of the French capital in all the different classes of society. The *Boulevard des Italiens* is particularly known as the rendezvous of the fashionable, and the *Boulevard du Temple* as the place where the small theatres are to be found which are frequented by the common people and the inhabitants of the suburbs, for which reason the expression *Théâtre de Boulevard* is often employed to denote a theatre for the common people, or one of an inferior kind. The modern boulevards are for the most part situated at some distance from the bustle of the town, and are therefore less frequented than the older ones, which are in the very heart of the city, and in the neighborhood of the chief resorts of amusement and pleasure. The Thames Embankment, in London, though not usually called a boulevard, is of this order. See PARIS.

BOUL'GER, DEMETRIUS CHARLES, English writer: b. 1853, July 14. He is an authority on military topics and with Sir Lepel Griffin founded the *Asiatic Quarterly Review* in 1885 and edited it for nearly five years. He has published *Life of Jakoob, Bey of Kashgir* (1878); *England and Russia in Central Asia, Central Asian Portraits; The History of China; General Gordon's Letters from the Crimea; Armies of the Native States of India; Central Asian Questions; Lord William Bentinck; Short History of China; Life of Sir Stanford Raffles* (1897); *The Congo State* (1898); *The Belgians at Waterloo; India in the 19th Century* (1901); *Life of Gordon; Story of India; History of Belgium*, Part I. (1902); *Belgian Life in Town and Country* (1904); etc.

BOULGER, DOROTHY HENRIETTA (THEO. GIFT), English novelist: b. 1847, May 30. She is a daughter of Thomas Havers of Thelton Hall, Norfolk, and married George S. Boulger (q.v.), in 1879. She began to publish in 1871, and is the author of *True to Her Trust; Pretty Miss Bellew; Maid Ellice; A Matter-of-Fact Girl; Visited on the Children; Victims; Lil Lorimer; An Innocent Victim; A Garden of Girls; Not for the Night-time; Dishonored; Wrecked at the Outset; An Island Princess; Women Who Work; Cape Town Dicky; The Little Colonists; Fairy Tales from the Far East; The Case of a Man with His Wife.*

BOULGER, GEORGE SIMONDS, English botanist: b. Bleechingly, Surrey 1853, March 5. He has been professor of botany and geology at City of London College from 1884 and has published *Familiar Trees* (1886–9); *The*

Uses of Plants (1889); *Biographical Index of British and Irish Botanists*, with Britten (1893); *The Country, Month by Month*, with Owen (1894–5); *Elementary Geology* (1896); *Flowers of the Field* (1900); *Wood* (1902).

BOULOGNE, *bô-lōn'*, Fr. *bôlōñ':* town of France, dept. of the Seine, on the right bank of the river Seine, about 5 m. w. of Paris, from which it is separated by the Bois de Boulogne. A fine stone bridge of 12 arches crosses the Seine from B. to St. Cloud. Pop. 44,400.

The Bois de Boulogne is traversed by many walks, through the broadest of which the fashionable world of Paris travels in Easter-week to the Abbey of Longchamp. At the entrance of the wood lies Auteuil (q.v.). During the Revolution the trees of the older walks were mostly cut down; but when Napoleon chose St. Cloud, in the immediate neighborhood, for his summer residence, new walks were planted and laid off, and the inclosing walls were restored. This wood, which from ancient times to the present day has been a place of enjoyment and recreation to the Parisians, was again much injured during the siege of 1870–1.

BOULOGNE-SUR-MER, *bô-loñ'sür-mär:* fortified seaport in the dept. of Pas-de-Calais, France, at the mouth of the Lianne, in the English Channel, about 19 m. s.w. of Calais, 139 m. n.n.w. of Paris; lat. 50° 45′ n., long. 1° 36′ e. The town consists of two parts—Upper and Lower Boulogne. The upper town was, in former times, strongly fortified; but its citadel was demolished, 1690, and its ramparts have been converted into beautiful promenades, with fine views, from which, in clear weather, the spire of Dover, Eng., can be seen. The upper town contains the Hôtel-de-Ville, and the Cathedral, a modern edifice with a conspicuous dome. The lower town, properly the seaport, is newer, finer, more populous, and more lively, inhabited chiefly by merchants, mariners, and fishermen. It contains the barracks, the great hospital, the theatre, the museum, and gallery of art. The streets have been much improved by the side-pavement, and many new and elegant buildings have been erected. A large wet-dock was completed 1872. B. has numerous churches and educational institutions; is the seat of various associations; has extensive and excellent salt-water baths; and, on account of its fine sands, is much resorted to for sea-bathing. The people are actively engaged in the boiling of sugar, in the manufacture of linen and sail-cloth, cordage, etc., and in fishing, the coast being productive in oysters, herring, cod, and mackerel. B. has an active coasting trade, and ranks with Calais as one of the nearest and most frequented places of passage between France and England, steamers plying daily to London, which they reach in from 9 to 10 hours, and twice a day to Folkstone, which they reach in about two hours. B. is much resorted to by the English, who form a large section of the population, and for whose accommodation there are

numerous hotels and boarding-houses. Paris is reached by railway from B. in 4½ hours. The harbor of B. is too shallow for great ships of war, which can reach only the wide and safe roads of St. Jean; it has been, however, repeatedly enlarged and improved, so as to admit large merchant vessels at high water. A new and extensive deep-sea harbor was begun 1879. The long pier forms a fine promenade. B. was anciently called *Gesoriacum*, in the country of the Morini; after the time of Constantine the Great, it was called *Bononia*, and after that of the Carlovingians, *Bolonia*. In 1435, B. came into the possession of the Duke of Burgundy and was united with the crown of France by Louis XI., 1477. B. was besieged by Henry VII. of England, 1492, taken by Henry VIII., 1544, and restored to the French by Edward VI., 1550. B. was selected by Napoleon as the starting point for the invasion of England, and here he encamped 180,000 men and collected 2,400 transports, ready at any favorable moment to swoop down on the shores of Britain; but, after months' watching, the war with Austria created other employment for them. As a memorial of this great camp a tall marble column was commenced on the higher grounds, but being incomplete at the restoration of the Bourbons it was finished and inaugurated in honor of Louis XVIII. It has since been restored to its original object and surmounted by a colossal statue of Napoleon. The poets Campbell and Churchill died at B., and the house, or rather the house occupying the site of that in which Le Sage, author of *Gil Blas*, is said to have died, is shown to the visitor. Altogether, B. is a thriving and agreeable place of residence, and from its accessibility to English tourists and rapid railway transit to Paris it has greatly superseded Calais as a place of debarkation. Pop. 50,000.

BOULT, v.: see BOLT 2.

BOULTER, *bōl'tėr*, HUGH, Archbishop of Armagh, Primate of Ireland: 1671–1742. This English prelate, accompanied George I. into Hanover as chaplain, and was afterward Bp. of Bristol and Dean of Christ Church, Oxford. Ireland, to which he went as primate and chief justice, was suffering with all the evils of civil discord; and the new archbishop applied himself to their mitigation with a zeal and charity that knew no bounds. In the famine of 1740 he fed, at his own expense, thousands of poor people daily. He spent $150,000 in assisting poor clergymen and in establishing schools and hospitals, etc. Although very learned his writings that remain are only *Sermons* and *Pastoral Letters* (Oxford, 1769, 2 vols.).

BOULTON, *bōl'tun*, MATTHEW: English mechanician: 1728–1809, Aug. 17; b. Birmingham, where his father, a steel manufacturer, had acquired wealth. When still very young he undertook, at his father's death, the business of the manufactory, which he carried on with great energy, and extended, 1762, by the purchase of a piece of land, then

a barren heath, at Soho, near his native town. One of his first inventions was a new mode of inlaying steel. He entered into partnership with James Watt (q.v.), who had obtained a patent for the great improvements in the steam-engine which have immortalized his name, and they established a manufactory of steam-engines 1769. They jointly contributed also to the improvement of coining machinery, and so to the perfection of the coinage itself. B. was extremely amiable and generous.

BOUNCE, n. *bowns* [Dut. *bonzen*, to knock—from *bons*, a blow: Gael. *boṅnsaig*, to leap, to bounce—from *bonn*, a heel, a basis]: the rebound of a heavy blow or thump; a sudden fall; a loud sound; an untruthful boast: V. to leap, rush, or spring out suddenly; to boast boldly; to lie. BOUN'CING, imp.: ADJ. large; heavy; stout and active. BOUNCED, pp. *bownst*. BOUN'CER, n. *-sẽr*, a bold boaster; a liar; a falsehood; lie; in American slang, one who summarily ejects an importunate caller. BOUN'CINGLY, ad. *-lĭ*.

BOUND, *bownd*: pt. and pp. of BIND, which see; confined or restrained—as *wind-bound*, *ice-bound*; obliged by moral ties.

BOUND, a. *bownd* [Icel. *búinn*, prepared, ready—from *búa*, to prepare, to set out]: going, or ready to go to; destined; bent toward a place.

BOUND, n. *bownd* [F. *borne*; OF. *bonne*, a limit—from mid. L. *bodĭna*, a limit or march]: a limit: V. to limit: to restrain or confine. BOUND'ING, imp. BOUND'ED, pp. BOUND'LESS, a. without limits. BOUND'LESSLY, ad. *-lĭ*. BOUND'LESSNESS, n. the quality of being without bounds or limits. BOUNDARY, n. *bown'dẽr-ĭ*, the bounds, or what marks the bounds; the tangible or visible mark which indicates the bounds: see PARISH: BEATING THE BOUNDS. *Bound*, or *Boundary*, is the utmost limits of land by which the same is known and can be described; being in *this* sense synonymous with *abuttals*. The *sides* of the land are properly said to be *adjoining*, and the ends *abutting* to the thing contiguous.—SYN. of 'boundary': border; frontier; confines; precincts; limit; purlieu; termination; barrier; verge; —of 'boundless': unbounded; unlimited: infinite; unconfined; unmeasurable; illimitable; unrestricted.

BOUND, v. *bownd* [F. *bondir*, to resound or re-echo, as by leaps, then to bound or leap—from mid. L. *bombĭtārĕ*, to resound—*lit.*, to resound or re-echo]: to rebound; to spring or leap; to move forward by leaps or jumps: N. a leap; a spring; a rebound. BOUND'ING, imp.: ADJ. springing or moving forward by leap: N. a starting or springing out or upward. BOUND'ED, pp. BOUNDING-STONE, a stone to play with.

BOUNDARIES OF THE UNITED STATES, DISPUTES AND SETTLEMENTS.—*Northeastern Boundary.* —The diplomatic controversy between Great Britain and the United States over the Northeastern boundary between the two countries, lasted some 59 years (1783–1842),

and at one time the disagreement became so acute that war was averted with some difficulty. In the Treaty of Paris (1783), (q. v.), by which the independence of the United States was acknowledged, the Northeastern and Northern boundary of the new republic was defined in so loose a manner that further adjustment was sure to be demanded. Moreover, the relations between the two countries, for several decades after the treaty of peace, were so strained that it was not easy for either to make concessions to the claims of the other. As the provisions of this treaty (1783), however, formed the basis for future negotiations, it will be well to examine the boundary line as laid down in that document. It was declared to run from the northwest angle of Nova Scotia, viz., that angle which is formed by a line drawn due north from the source of the St. Croix river to the Highlands: along said Highlands, which divide the rivers flowing into the St. Lawrence from those flowing into the Atlantic, to the northwesternmost head of the Connecticut river; thence down the middle of that river to the 58th degree of north latitude; thence by a line due west to the river Iroquois or St. Lawrence and down the middle of this river to Lake Ontario, and thence through the middle of the Great Lakes to the Lake of the Woods. Under the treaty of 1794 a joint Commission was appointed to settle the first part of the boundary on the northeast, which concerned the identity of the St. Croix river. England claimed the true St. Croix to be one river; the United States insisted that it was another. In 1798 a conclusion was reached, by which the St. Croix was fully identified, and a monument placed at its source. No agreement, however, was reached as to the location of the 'northwest point of Nova Scotia,' or as to the situation of the Highlands mentioned in the treaty. The American government maintained that these Highlands, according to Oswald's map, were to be found not far from the St. Lawrence river, and that 'the northwest point' of Nova Scotia was near the eastern end of these Highlands. The British, on the other hand, insisted that the northwest corner of Nova Scotia was much farther to the south and that, according to other old maps, the true Highlands ran through the central portion of Maine. The controversy was further complicated by a disagreement between the two countries as to whether the rivers discharging their waters into the Bay of Fundy were 'rivers falling into the Atlantic Ocean,' in the sense of the treaty of 1783. These questions were not finally settled until 1842, but in the intermediate period several attempts were made to arrive at an amicable settlement. For instance, in 1803 a joint Commission was again appointed to ascertain the northwest angle of Nova Scotia, to run a line from the monument at the source of the St. Croix to this northwest angle; also to determine what was the northwesternmost head of the Connecticut river, and to run a line from it to the corner of Nova Scotia. The work of this Commission might have been successful, but the purchase of Louisiana

by the United States in 1803 upset the whole arrangement for the following reason. In addition to its duties already named the Commission was to agree on a boundary beyond the Lake of the Woods, but in this region the recent purchase was held by the United States to give this country additional claims, and as England did not admit this contention, the Commission did nothing. As a result of the treaty of Ghent (q. v.) 1814, a similar Commission was appointed, but after exploring the country, the members failed to agree and were dismissed. In 1827, the King of the Netherlands was called in as arbitrator. His award gave a part of the disputed territory to England and a part to the United States; but neither power was willing to accept these concessions. In 1839 the controversy was aggravated by an *ex parte* survey made by two British commissioners, who discovered that no one had been right and that a new line of Highlands, cutting across the waters of the Aroostook and other streams emptying into the St. John river was the proper line. It looked now as if the State of Maine was about to take matters into its own hands. A kind of border warfare broke out; forts were built along the frontier, and the legislature placed $800,000 at the disposal of the governor to be used for the military defence of the State. Major-General Scott of the United States army hastened to the border and patched up a treaty between the contending parties for the temporary joint possession of the disputed land. This trouble hastened the final settlement of the questions at issue. In 1842 Lord Ashburton was sent by Great Britain to the United States as Special Commissioner to settle the boundary dispute and other contentions that had arisen between the two countries. Ashburton entered into negotiations with Daniel Webster, our Secretary of State, and in the same year (1842) the treaty was signed between Great Britain and the United States. The boundary as finally established affected the States of Maine, New Hampshire, Vermont, and New York. By a skilful compromise and the payment to Maine by our government of a handsome sum for the concessions which that State was obliged to make, an agreement was reached that gave pretty general satisfaction. There were, of course, critics who maintained that we had granted too much territory to Great Britain, but Webster defended the treaty in a speech of singular power (Works, vol. v. p. 78). The line agreed upon at this time has remained the northern boundary of this portion of the United States to the present day. As stated in the treaty it is extremely complex, but it may be succinctly stated as follows: Beginning at the monument at the source of the St. Croix it runs north to the river St. John, thence up the middle channel of the said river to the mouth of the St. Francis river; thence up the middle of this river and of the lakes through which it flows to the outlet of Lake Pohenagamook; thence southwesterly in a straight line to a certain point on the northwest branch of the river St. John; thence in an irregular line to the

southwest branch of the St. John and along this branch to the neighboring highlands which form the watershed; thence down along said highlands to the head of Hall's Stream; thence down this stream to the 45th degree north latitude, which was understood to be the line of actual division between Canada and the States of New York and Vermont; and thence along said dividing line to the St. Lawrence.

The Northern Boundary.—The determination of the Northern boundary was provided for in the treaty of 1783, but only as far as the Mississippi river, which was then the western boundary of the United States. The treaty of Ghent (1814) declared that doubts having arisen as to what was the middle of the great lakes and of the rivers or straits joining them, joint Commissioners should be appointed to determine the proper line. These commissioners, however, could come to no agreement upon the points submitted to them, and the matter was left to future negotiation. The chief causes of disagreement were the ownership of an island called St. George's Island, lying in the water communication between Lake Huron and Lake Superior, and secondly, the disagreement over the proper boundary through the water communication from Lake Superior to the Lake of the Woods. In the Ashburton treaty (1842) all these points were finally settled as far as the Northwestern point of the Lake of the Woods and thence due south to the 49th parallel of north latitude. This treaty also confirmed a previous treaty between the United States and Great Britain in 1818, by which the said 49th parallel was agreed upon as the boundary of the United States from the Lake of the Woods to the Rocky or Stony Mountains. This line, like the previous ones, was really a compromise: the United States gaining the valley of the Red River of the North, but sacrificing to Great Britain that portion of the Louisiana Purchase which was watered by the head streams of the Missouri.

Northwestern Boundary.—West of the Rocky Mountains no boundary line had as yet been agreed upon; for the United States and Great Britain held conflicting claims to the so-called Oregon region. All that could be done in the treaty of 1818 was to provide that 'the country claimed by either party westward of those mountains, with its harbors, bays, and creeks, and the navigation of all rivers, shall be free and open for a term of ten years to the vessels, citizens, and subjects of the two powers, without prejudice to any exclusive claim of either or to the claim of any other power.' The claims of the United States to the vast region known as the Oregon territory were various. They were based on the exploration of the Columbia river by Captain Gray in 1792, the Lewis and Clark exploration of 1804–6, the establishment of Astoria in 1811, the relinquishment by Spain in the Florida treaty of 1819 of all title she might have to that region by reason of Spanish navigators having touched upon that coast, and finally upon the purchase of Louisiana in 1803. This last was regarded by our country

as the strongest of all and was persistently urged by our diplomatists during a long series of years. They held that by the principle of the 'continuity of territory' Oregon was included in the Louisiana purchase and that the French had so regarded it. In 1829, however, Marbois, who negotiated the sale of Louisiana to the United States, declared that while, according to ancient documents, the bishopric of Louisiana was to extend to the Pacific Ocean, these limits were at best a matter of expectation and hope, and their spiritual jurisdiction had nothing to do with the question of dominion or ownership. The United States also maintained that France and Great Britain had in the 18th c. agreed on a line of boundary between Louisiana and Canada west of the Rockies; but the historian Bancroft has now shown that no such line was run. Even Mr. Jefferson, in 1816, declared that 'on the waters of the Pacific we can found no claim in right of Louisiana.' Of late years all historical writers have agreed with Jefferson that the purchase of Louisiana gave the United States no clear title to the Oregon region. The British contested our title and showed that the coast had been visited by Drake in 1580, had been explored by Cook in 1778, and had been a trading place jointly with Spain by a convention in 1790. By a treaty with Russia in 1824, the northern boundary of Oregon was fixed as 54° 40′ north latitude, but Great Britain took no part in this convention, preferring separate negotiations with Russia. Under the agreement of joint occupation, which lasted from 1818 to 1846, the British Hudson Bay Company tried to occupy as much territory as it could, and there was considerable immigration into Oregon from the United States. In 1844 the feeling against the British became so strong that the cry of 'Fifty-four-Forty or Fight' was raised, and it was proposed to drive the British settlers out of the whole region from the northern boundary of California to the southern boundary of Russia. The United States government, however, had for some time been willing to continue the boundary along the 49th parallel from the Rockies to the Pacific. The British, on the other hand, had objected to this line because it gave to the United States the lower end of Vancouver's Island and the important Strait of Juan de Fuca to the south of the island. Finally in 1846, a compromise was agreed upon. The United States consented to run the line to Vancouver's Sound and through the middle of the Strait to the ocean. The latter part of this line, however, became a matter of dispute, and many years later was submitted to arbitration. The decision, which especially concerned the ownership of St. Juan Island, was finally given in favor of the United States (1872). In 1867 the United States purchased from Russia the territory of Alaska. From this purchase there arose a contention between the American government and the Canadian authorities over the boundary of Alaska. In this wild region the dispute was not regarded as a matter of much importance until the discovery of gold on the Yukon in

1896–7 and the rapid increase of population showed the value of the country. In 1903 the Alaskan Boundary Commission meeting in London, decided the disputed line from Mount St. Elias to the Portland Canal.

The Southwestern Boundary.—We have seen that the acquisition of Louisiana by the United States in 1803 left the Northwestern boundary of this country in an unsettled condition. In no less degree did it open the way to diplomatic negotiations on the southern and southwestern frontier. When Napoleon was asked to define the boundaries of Louisiana, he admitted that the treaty by which he had ceded it to the United States was obscure, but he added that 'if there were no obscurity, it would be good policy to insert some.' The obscurity arose from the ambiguous wording of the treaty between Spain and France, by which the latter country obtained the territory, before ceding it to the United States. This treaty declared that His Catholic Majesty promised to retrocede to the French Republic 'the colony or province of Louisiana with the same extent it now has in the hands of Spain and that it had when France possessed it, and such as it should be after the treaties subsequently entered into between Spain and other States.' Here no definite boundaries are given, and the subsequent treaty of France with the United States simply ceded the same territory 'with all its rights and appurtenances as fully and in the same manner as they have been acquired by the French Republic in virtue of the above-mentioned treaty.'

As soon as the United States took possession of Louisiana it claimed both West Florida and Texas as portions of the purchase, but Spain refused to recognize these claims on the ground that France had never possessed Texas and that by a treaty in 1783 Great Britain had transferred West Florida to Spain. At the time the United States did not try to enforce its claim to either piece of territory and Spain continued to hold possession. In 1810, however, the American settlers in West Florida revolted against Spain and set up an independent government. At their request the United States took the new state under its protection, and in 1812 added that portion of it lying west of the Pearl river to the State of Louisiana. Spain protested against this action, but was too weak to do more. After negotiations that lasted for a number of years both the Texan and the West Florida questions were settled by the treaty between the United States and Spain in 1819. By this treaty the United States acquired a full title to both East and West Florida on the payment $5,000,000 to Americans holding claims against Spain, and at the same time gave up all title to Texas. The boundary line agreed upon was to begin at the mouth of the Sabine river (the present western boundary of Louisiana) and up that river to the Red river and along that river to the one hundredth meridian; from that point due north to the Arkansas river, following the channel of that stream to its source, thence northward or southward, as the case might

be, to the forty-second parallel and along that line (the present northern boundary of California) to the Pacific Ocean. There was a wide-spread feeling in the United States that our government could justly have claimed all Texas to the Rio Grande as a part of the Louisiana Purchase, and it is a mooted question to the present day. Henry Adams, the historian, has clearly shown that Napoleon, had he kept Louisiana, would have regarded Texas as a part of it, but other historians maintain that while Spain would have been obliged to yield to his power, her protest would have been justifiable. Soon after Texas entered the Union (1845) a controversy arose between the United States and Mexico as to the southern boundary of the new state. As a republic Texas claimed the Rio Grande as its boundary, but as a previous state of the Mexican Republic it extended only as far as the Nueces river. As the Rio Grande was the old boundary of Texas in 1800, and as Texas still claimed it, the American government re-asserted it, and soon found itself at war with Mexico (1846–48). The treaty of Guadalope Hidalgo, which ended this war, ceded to the United States all territory north of the Rio Grande and the Gila rivers, including New Mexico, California, Nevada, Utah, Arizona, and parts of Colorado and Wyoming, about 524,000 square miles. If we make it include Texas it was a larger area than had been acquired by the Louisiana Purchase. In 1853 the southwest boundary of the United States was still further extended by what is known as the Gadsden Purchase (q. v.). This consists of some 45,535 square miles, purchased from Mexico for $10,000,000. The purchase fixed the present boundary of the United States in that region and at the same time ended a dispute between the two countries over the possession of the Mesilla Valley, which had threatened serious trouble. The boundary as laid down in this treaty is as follows: Beginning in the Gulf of Mexico, three leagues from land, opposite the mouth of the Rio Grande; thence up the middle of that river to the point where the parallel of 31° 47′ north latitude crosses the same; thence due west one hundred miles, thence south to the parallel of 31° 20′ north latitude; thence along the said parallel of 31° 20′ to the 111th meridian of longitude west of Greenwich; thence in a straight line to a point on the Colorado river twenty miles below the junction of the Gila and Colorado rivers; thence up the middle of the said Colorado river until it intersects the present line between the United States and Mexico.

Bibliography, Bancroft, *History of the United States;* Webster, *Works, V. and VI.;* Greenhow, *History of Oregon;* Ficklen, *Northwestern Boundary of Louisiana,* in Pubs. La. Hist. Soc., 1898; Ficklen, *Texas and the Louisiana Purchase* in Pubs. of South. Hist. Asso., Sept. 1901; Henry Adams, *History of the United States;* Channing, *The Jeffersonian System;* McDonald, *Select Documents,* 1776–1861; *Revised Statutes of the U. S.*

BOUND BROOK: borough in Bridgewater tp., Somer-

set Co., N. J.; 31 m. s.w. of New York; on the Raritan river and the Delaware and Raritan canal. It is a pleasant village, noted as a railroad junction, and for an extensive lumber trade. During the revolution it was one of the places of winter encampment for Washington's army. Pop. about 3,000.

BOUNDEN, a. *bown'dĕn* [from BIND]: morally imperative; obligatory.

BOUNTIHEAD, n. *bown'tĭ-hĕd* [F. *bonté*, goodness: AS. *had*, person, head, state, condition]: in *OE.*, goodness; virtue: also BOUNTIHOOD, n. same sense.

BOUNTY, n. *bown'tĭ* [F. *bonté*, goodness—from L. *bonĭtātem*—from *bŏnus*, good: It. *bonitate*]: liberality in giving; kind favors; anything given over and above what is due; a premium. BOUNTEOUS, n. *bown'tĭ-ŭs*, liberal and generous; very kind in bestowing favors. BOUN'TEOUSLY, ad. *-lĭ*. BOUN'TEOUSNESS, n. BOUNTIFUL, a. *bown'tĭ-fûl*, liberal in bestowing gifts and favors. BOUN'TIFULLY, ad. *-lĭ*. BOUN'TIFULNESS, n. liberality in the bestowal of gifts and favors.—SYN. of 'bounty': generosity; munificence; kindness; liberality; beneficence; bountifulness; benevolence.

BOUNTY: a term applied to any sum granted by the legislature toward creating or encouraging some kind of undertaking believed to be of national importance. At one time, in Britain, there was no end to the giving of bounties in this way from the public purse—there were bounties on exporting corn, with a view of encouraging agriculture; bounties on the tonnage of vessels employed in the herring and whale fisheries; on the importation of materials of manufactures; on the importation of indigo from the colonies; on the exportation of Irish linen, etc. The theory that bounties may properly be given to a limited extent and with caution, as an encouragement in the infancy of undertakings, is advocated by some economists and vehemently denounced by others. The latter assert that, beside taxing the general community in order to reward or encourage individuals, bounties do no real good to the parties so favored; for by such inducements they engage in businesses for which they have no special vocation, or which, in existing circumstances, it would be preferable to let alone; thus bounties are held to share in the condemnation due to all measures alleged to be for the special protection of any trade or business. The subsidies in the form of extra rate paid to certain steamboat companies for carrying the mails may be said to be the last remnant of British bounties. The carrying of the mails, as involving greater responsibilities than ordinary goods, is paid at much higher rates, even where the ordinary traffic is remunerative, as on the Atlantic route, which is crossed by the greatest number of steamboat lines. These contracts have been objected to in the house of commons as monopolies. But on the other hand—in favor of a cautious and limited bounty for a transitorial period, in selected cases, with a view to all the facts that bear on the public interest in

each case—it is argued that no sweeping generalization can foreclose the case where interests so complex are involved; that a *doctrinaire* theory should be brought to the test of experience before it is established as authority beyond appeal; that former abuses or even some present risks in the line of a certain practice are not a final argument against it. The question has become a practical one in the United States, since 1890–1: see SUBSIDY.—The McKinley act of 1890 granted a B. to the producers of all kinds of sugars produced in the United States.—See FREE TRADE: TARIFF: CUSTOMS DUTIES: etc.

BOUNTY, in the Army or Navy: a sum of money given to encourage men to enter the service. In the time of peace, the B. sinks to a minimum; but in cases of exigency it is raised. In the United States, B. is a term for grants of land to soldiers and sailors, their widows and children, on account of service in the army and navy. Also the money paid to the 'substitutes' of drafted men is called a Bounty.—See ENLISTMENT: RECRUITING: PRIZE: SALVAGE: BOOTY.

BOUNTY, MUTINY OF THE: see PITCAIRN ISLAND.

BOUQUET, n. *bô-kā'* [F. *bouquet*—from OF. *bosquet*, a little wood—from OF. *bos*; F. *bois*, a wood]: a bunch of flowers; a nosegay; the peculiar scent or odor characteristic of each variety of the better class of wines, due principally to the presence of œnanthic ether: see WINE.

BOUQUETIN, *bô'-kĕt-ĭn*, or IBEX of the Alps (*Capra Ibex*): species of goat which inhabits the highest regions of the Alps, even higher and wilder than those inhabited by the chamois, up to the limits of perpetual snow. It is the *Ibex* of the ancients: see IBEX. In German Switzerland its name is *Steinbock*. It was at one time found on all the higher Alps, but has disappeared from most of them and exists chiefly on those between the Valais and Piedmont, where it is carefully protected by the Italian government. It is larger and more powerful than the common goat and has a small head and great horns (those of the male 1½–2 ft. long), which curve backward, are directed a little outward, and have prominent transverse knots or bands on the front. The horns of the females are only about six inches long. The hoofs are large, rough on the sole, and capable of being spread widely apart, to give greater security of footing. The general color is brown. The body is covered with two kinds of hair, the longer hair being mixed, at least in winter, with thick, soft wool. There is no beard, except a few hairs in winter, although the animal has been often incorrectly figured as having one.

The B. feeds on the herbage and small shrubs found on the last confines of vegetation, and descends by night to browse in the highest forests, the lichens and branches of which supply much of its winter food. It is capable of enduring great cold and will remain, with seeming indifference, for hours on the summit of a rock, motionless, during the most severe storm.

BOURBON, *bôr'bun*, Fr. *bór-bōng'*: a French family of the highest note in history, and which came to possess several European thrones, deriving its name from the castle and seignory of Bourbon, in the former province of Bourbonnais, in the centre of France. The first lord or *sire* of this family of whom history makes mention was Adhémar, at the beginning of the 10th c. The fourth in succession from him, Archambauld I., added the name of the family castle to his own. Under his successors, who also bore the name of Archambauld, the family possessions were soon very much increased. At length the seignory of Bourbon, having devolved upon an heiress, who in 1272, married Robert, the sixth son of Louis IX. of France, thus passed to a branch of the royal family of the Capets, under whom it was converted into a duchy. The principal branch of this family was deprived, 1523, of all its dignities and possessions, because the duke, Charles de B. (q.v.), the famous Constable, allied himself with Charles V. against Francis I. of France.

Of the collateral branches, that of Vendôme acquired great importance, first attaining by marriage, in the person of Antoine de B., Duke of Vendôme, to the throne of Navarre; afterward by inheritance to the throne of France, in the person of Henry IV., on the extinction of the male line of the House of Valois, and by the fortune of war to the thrones of Spain and Naples. Among the numerous other collateral branches may be mentioned those of Montpensier, De la Marche, Condé, Conti, Soissons, and Orleans. Only a few members of the collateral lines, however, have borne the name of B.; for example, the Cardinal Charles de B., Duke of Vendôme, who under the name of Charles X., was set up by the Catholic League as a rival king to Henry IV. The ducal dignity was revived by Louis XIV. in the House of Condé, so that the eldest son of that house should bear the title of Duke of Bourbon.

The dynasty of the Bourbons in France begins with Henry IV. (q.v.), who, after the assassination of Henry III., became, in virtue of the Salic Law (q.v.), the next heir to the French throne. Through his father Antoine de B., King of Navarre and Duke of Vendôme, he was descended from Robert, son of Louis IX., and husband of Beatrix, heiress of Bourbon. On his assassination, 1610, he left by his second wife, Mary de' Medici, five legitimate children; 1. Louis XIII. (q.v.), his successor on the throne; 2. J. B. Gaston, Duke of Orleans (q.v.), who died 1660, and left no male heirs; 3. Elizabeth, married to Philip IV. of Spain; 4. Christina, married to Victor Amadeus, afterward Duke of Savoy; 5. Henrietta, married to Charles I. of England.—Louis XIII., on his death, 1643, left two sons by his queen, Anne of Austria: 1. Louis XIV. (q.v.), his successor; and, 2., Philip, who received from his elder brother the title of Duke of Orleans, and was the founder of the family which has become the younger B. dynasty. —The Dauphin Louis, styled Monsieur, son of Louis XIV., by his marriage with Maria Theresa of Austria, died 1711, Apr. 14, and left three sons by his marriage with Maria

Anna of Bavaria: 1. Louis, Duke of Burgundy (q.v.); 2. Philip, Duke of Anjou, who afterward became king of Spain, as Philip V.; 3. Charles, Duke of Berri, who died 1714.—Louis, Duke of Burgundy, died 1712. By his wife, Maria Adelaide of Savoy, he had three sons, of whom two died in early youth, the only one who survived being Louis XV., who succeeded his great grandfather, Louis XIV., 1715.—Louis XV. having married Maria Leszcynska, daughter of the dethroned king Stanislaus of Poland, had by her a son, the Dauphin Louis, who married Maria Josepha of Saxony, and died 1765, leaving three sons: 1. Louis XVI. (q.v.), who succeeded his grandfather, Louis XV., 1774; 2. Louis Stanislaus Xavier, Count of Provence, afterward Louis XVIII.; 3. Charles Philippe, Count of Artois, afterward Charles X.—Louis XVI. had three children by his queen, Marie Antoinette of Austria: 1. The Dauphin Louis, who died 1789; 2. Louis, called Louis XVII. (q.v.), who died 1795; 3. Marie Therese Charlotte, styled Madame Royale, afterward Duchesse d'Angoulême (q.v.).—Louis XVIII. had no children, but Charles X. had two sons: 1. Louis Antoine de B., Duke of Angoulême (q.v.), who was dauphin prior to the Revolution of 1830, and died without issue 1844; 2. Charles Ferdinand, Duke of Berri (q.v.), who was murdered 1820. The Duke of Berri left two children: 1. Marie Louise Therese, styled Mademoiselle d'Artois, married to the duke of Parma; 2. Henry Charles Ferdinand Marie Dieudonné, Duke of Bordeaux, styled Count de Chambord (q.v.); he died childless 1883, when the Legitimists of France accepted in his room the Orleanist Duc de Paris as head of the house of Bourbon.

It has already been stated that the founder of the Orleans, or younger branch of the B. royal family of France, was Philip, Duke of Orleans (q.v.), the younger brother of Louis XIV. He died 1701, leaving, by his second marriage with Elizabeth Charlotte of the Palatinate, a son of his own name as his heir, who was Regent of France during the minority of Louis XV. His son Louis Philippe, Duke of Orleans (b. 1703), married a princess of Baden, and died 1752, leaving an only son of his own name (b. 1725, d. 1785), whose son and heir was that Louis Joseph Philippe, Duke of Orleans (q.v.), so notable in the French Revolution, who, 1792, renounced his rank, taking the name of Citizen Egalité, and died by the guillotine 1793. He left four children: 1. Louis Philippe (q.v.), who, before the Revolution, was styled Duke of Chartres—that being the ordinary title of the eldest son of the Orleans family—became afterward Duke of Orleans, was King of the French 1830–48, and died in England 1850, Aug. 26; 2. The Duke de Montpensier, who died in England 1807; 3. the Count de Beaujolais, who died at Malta 1808; 4. Adelaide, styled Mademoiselle d'Orleans, b. 1777, d. 1847.—Louis Philippe left a numerous family by his queen, Amelia of Naples, but his eldest son, Ferdinand, Duke of Orleans, lost his life by an accident 1842, July 13, leaving by his wife, the Princess Helen of Mecklenburg-Schwerin,

two sons, the eldest of whom, Louis Philippe Albert, now styled Count of Paris, is the representative of the younger or Orleans B. family. Concerning the other members of Louis Philippe's family, see LOUIS PHILIPPE.

Louis XIV., having succeeded in placing his grandson, Philippe, Duke of Anjou, on the throne of Spain in 1700 as Philip V., this prince became the founder of the Spanish B. dynasty, as well as of the B. dynasties of Naples, Parma, and Piacenza. These dynasties endured only a temporary overthrow from the policy and arms of Napoleon Bonaparte. Philip V. was succeeded on the Spanish throne by his son, Ferdinand VI., who died without issue 1759, and the crown fell to his brother, Charles III., whose son and successor, Charles IV., was compelled to resign it, 1808, in favor of a successor nominated by Napoleon, and died at Rome 1811. The two eldest sons of Charles IV. by his marriage with Maria Louisa of Parma were—1. Don Fernando, Prince of Asturias, who, after the overthrow of Napoleon, resigned as Ferdinand VII. (q.v.), whose eldest daughter was Isabella II., the mother of Alfonso XII.; 2. Don Carlos (q.v.), who, on the death of his elder brother in 1833, became pretender to the Spanish throne until 1845, when he resigned his pretensions in favor of his son, Count de Montemolin. Don Carlos died at Trieste 1855. The Count de Montemolin died 1861, and his claims to the Spanish throne are now represented by his nephew, Don Carlos, son of his brother Juan.

Philip V. did not succeed in keeping possession of the crown of the Two Sicilies (see NAPLES) as of that of Spain, the House of Hapsburg being restored there in the person of a son of Leopold I., who in 1720 ascended the throne as Charles III. But in consequence of the peace of Vienna, the son of Philip V. became king of the Two Sicilies, likewise by the name of Charles III. Upon his accession to the throne of Spain, 1759, he gave up that of Sicily to his third son, Don Fernando, called Ferdinand IV., with the express stipulation that it should never again be occupied by a king of Spain. Ferdinand IV. was compelled to yield to the French arms, 1806, but after the overthrow of Napoleon he became king of the Two Sicilies as Ferdinand I. (q.v.). His son, Francis I., left the throne in 1830 to his son Ferdinand II. (q.v.), whose son, Francis II., was expelled, 1860, when Naples was incorporated with the new kingdom of Italy.

By the peace of Aix-la-Chapelle, 1748, Austria made over the duchies of Parma and Piacenza to Don Philip, youngest son of Philip V. of Spain, but with stipulation of their reversion to Austria on the failure of his male descendants, or on his succeeding to the throne of Spain. He was succeeded 1765 by his son, Ferdinand I., whose son, the hereditary Prince Charles Louis Ferdinand, was made king of Etruria, 1801, under the guardianship of his mother, Maria Louisa of Spain; but Etruria, being soon incorporated with France, they were completely dispossessed. The Congress of Vienna asssigned Parma and Piacenza for life to Maria Louisa of Austria, the spouse of Napoleon, but meanwhile

indemnified Maria Louisa of Spain with the duchy of Lucca. In 1847, Parma and Piacenza reverted to the B. family in the person of the king of Etruria, Charles Louis de B., who had succeeded his mother in Lucca, 1824. He abdicated, 1849, Mar. 14, and was succeeded as Duke of Parma and Piacenza by his son, Charles III., and he in 1854 by his son Robert (b. 1848), whose mother, Maria Louisa Theresa de B., daughter of the Duke of Berri, then became regent of the duchies. The B. family lost these duchies, 1859. See ITALY and PARMA: see also Coiffier-Demoret, *Histoire du Bourbonnais* (1828); Achaintre, *Histoire Chronologique et Généalogique de la Maison Royale de Bourbon* (1825); also histories by Mure (Par. 1860–68) and Dussieux (1869).

BOURBON, CHARLES, Duke DU BOURBONNAIS, styled CONSTABLE DE BOURBON: 1489–1527, May 6; son of the Count of Montpensier; and in consequence of the death of his elder brother and his marriage with the only daughter of the Duke of Bourbon, he united in his own possession the vast estates of both these branches of the Bourbon family. Holding a very high position in virtue of his birth and wealth, he soon showed himself to be no ordinary character, by the brilliancy of his exploits in arms and by his rigid morals and severe, taciturn disposition. At the age of 26 he received from Francis I. the Constable's sword, and was sent to Italy at the head of an army, which he disciplined on the march, and crossing the Alps by passes previously deemed impracticable, he surprised the hostile generals, won the battle of Marignan (1515), and within a few days placed the keys of the citadel of Milan in the king's hand, acquiring for himself by these exploits the reputation of the greatest general of his time. But Maria Louisa, the king's mother, became enamored of the brave Constable, and he, although a widower, declined her hand, openly declaring that he deemed her a woman devoid of modesty and not to be thought of for a wife. Her revenge led to the seizure, on behalf of the crown, of the estates which he had acquired through his wife and the withholding of his pay as Constable. Thus deeply injured he renounced the interest of France, and concluded a private alliance with the emperor Charles V. and with Henry VIII. of England. The former agreed to give him in marriage his sister, Eleonora, who had Portugal as her jointure, and to make an independent kingdom for him of Provence and Dauphiné, with his own possessions of the Bourbonnais and Auvergne. The rest of France was to be apportioned between the two confederates. The king, who was engaged in an expedition to Italy, received intelligence of this conspiracy. Forthwith he proceeded in person to the Constable and offered him restoration to favor and also of his estates. The Constable, however, did not trust him but fled in disguise and reached Franche Comté in 1523. In order not to appear as a fugitive to the Spanish army,

which awaited him in Lombardy, he drew around him 6,000 German lancers and soon contrived to gain their entire attachment. He attacked, 1524, the French army on its march over the Alps, and thought to have advanced to the heart of France with the Spaniards whose general he had been appointed by the emperor. But Charles V. did not entirely trust him and appointed the Marquis of Pescara to assist and watch him. He was compelled to relinquish the siege of Marseille on the approach of Francis I. with a great army. He repassed the Alps and took his revenge in the battle of Pavia, 1525, Feb. 24, where the king was made a prisoner. He now went to Madrid, but soon found himself entirely disappointed in his hopes and was sent back to Lombardy by Charles V. Without money or support, surrounded by daring and mutinous bands, he conceived a plan to found for himself an independent dominion and to unite himself with France against Spain. Hastily gathering together the wild bands around Milan he led them against Rome; and, 1527, May 6, unprovided with things necessary for siege appeared before the walls of that city. Resolved to conquer or die, he led up his troops in the most impetuous manner and eagerly seized with his own hands a scaling-ladder, in order to make his way over a weak place of the wall, when he was mortally wounded by a bullet, which Benvenuto Cellini afterward asserted that he had shot. His death was kept secret for a time from the storming army under his command. When it departed from Rome, two months later, his corpse, which the soldiers would not part with, was taken with them and buried at Gaeta under a magnificent monument, which, however, was afterward destroyed.

BOURBON, Ile de, *èl dėh bôr-bōng′*, or, as it is called at present, RÉUNION, *rā-ü nē-ōng′*: island in the Indian Ocean, the southernmost of the Mascarene Isles, about 100 m. s.w. from Mauritius, 360 m. e. from Madagascar. It is one of the most important of the insular colonies of France. It is about 45 m. in length, and 33 in greatest breadth; abt. 965 sq. m. It may be described as one great mountain mass, of which the highest peaks are the Piton de Neiges—in the centre of the island, rising more than 10,000 ft. above the sea—the Grand Bernard, and the Cimandef, in the n., with respective heights of 9,500 and 7,300 ft.; and in the s.e., the Piton de Fournaise, 7,200 ft. high, one of the greatest volcanoes in the world, and one of the most active. This volcano occupies, perhaps, one sixth of the island, often changes its crater, and is surrounded by a district of more than 10,000 acres, which is a dreary desert and is called the *Pays Brûlé* (Burned Land). Except in this part, however, the soil is in general extremely fruitful. About a fourth part of the island is cultivated, chiefly along the coast, although much of the interior is of great natural fertility. The scenery is very beautiful. Streams although not large, are very numerous, and rush in cas-

cades to the sea. The climate, formerly mild and salubrious, is now very unhealthful to the Europeans, who cannot reside four of five years on the island without an attack of typhoid fever or dysentery. The s.e. monsoon and hurricanes often make fearful devastion. The plants of Arabia, of the Asiatic archipelago, and of the s. of Europe, thrive equally well here; coffee and cloves are produced, with the fruits of Italy and Spain. By far the most important article of export is sugar; coffee, vanilla, cloves, saltpetre, wood for cabinet-making, and dye-woods, are the other exports. The value of the exports, which up to 1867 had been steadily increasing, has since then greatly declined, as the crops have repeatedly suffered from cyclones, persistent drought, and blight. The cereals grown in the island are not sufficient for its own wants. Cattle are imported from Madagascar. The capital of the island, and seat of government, is St. Denis, on the n.w. coast, with 32,000 inhabitants, a college, a botanic garden, etc.; lat. 20° 52′ s., long. 55° 30′ e. The mean temperature here is 77° F. There is an almost total want of harbors, the whole coast of the island possessing only two tolerable anchoring-places—one at St. Denis and another at St. Paul, 18 m. farther s. But France is now constructing a new and great harbor, meant to be an eastern Cherbourg. B. and Mauritius were discovered by the Portuguese navigator, Mascarenhas, and named after him the Mascarene Isles. After the French had begun their attempt to found a colony in Madagascar they took possession of B., 1649, giving it that name, which was changed to Isle de la Réunion at the Revolution, and to Isle de Bonaparte 1809. The name has been varied according to the political changes in France, after the treaty of Paris, 1814, re-assuming the name Isle de Bourbon; and since 1848 called again Isle de la Réunion, by which it is now officially known. The French having in 1720 taken possession of Mauritius, which they named Isle of France, the Mascarene Isles were placed under one governor. In 1810 they were taken by the British, but B. was restored to France 1814. Pop. of Isle de Bourbon (1901), 173,230 including Chinese, negroes, East Indians, a French garrison and other officials.

BOURBONNAIS, *bôr-bon-nā′*: gently undulating, terrace-formed district in the centre of France, n. of the high lands of Auvergne, abounding in grain, fruits, wine, iron, marble, and mineral springs. From 1327–1523 it formed the duchy of Bourbon, and afterward, becoming a domain of the crown, it formed a separate province of France. It now constitutes the dept. of Allier, and part of the dept. of Cher. The capital was Moulins.

BOURBONNE-LES-BAINS, *bôr-bonn′lā-băng*: town of France, dept. of Haute-Marne, abt. 20 m. e.n.e. of Langres; pleasantly situated at the confluence of the Borne and the Aspance. It has some fine promenades and manufactures of cotton, hoisery, and cutlery. Its chief feature is its saline springs. Pop. 4,200.

BOURBON-VENDÉE: see NAPOLEON VENDÉE.

BOURD, n. *bôrd* [F. *bourde*, a lie, a sham, a jest: Bret. *bourd*, deceit: Gael. *burd*, mockery]: in *OE.*, the act of making fun of one by deceiving him; a jest; sport: V. to jest. BOURD'ING, imp. BOURD'ED, pp.

BOURDALOUE, *bôr-dâ-lô'*, LOUIS: 1632, Aug 20—1704, May 13; b. Bourges: one of the greatest pulpit orators of France. Having, at the age of 16, entered into the order of the Jesuits he obtained in succession the chairs of humanity, rhetoric, philosophy, and theological ethics in the acad. of his native place. He showed great capacity for science, but his remarkable eloquence led his superiors finally to determine upon employing him as a preacher. Disdaining the inflated style prevalent among the tasteless pulpit orators of his time, he assailed with manly vigor and truly religious earnestness the passions, weaknesses, and errors of men. The dignity of his manner and the fire of his eloquence made him famous, even when the public mind was occupied with the festivities of Versailles, the victories of Turenne, and the literary masterpieces of Corneille and Racine. At the court of Louis XIV. he was remarkably well received. After the revocation of the Edict of Nantes, he was sent to Montpellier, 1686, to labor among the Protestants on behalf of the Rom. Cath. Church. B. particularly understood how to accommodate his eloquence to the minds of those whom he addressed. Simple among the simple, a dialectician among ecclesiastics, he was equally a favorite with the common people and with the learned and the great. He was also much esteemed and beloved as a man, and in all circumstances maintained unimpeached a high reputation for candor and honesty. In the later years of his life he relinquished the pulpit and devoted his time to hospitals, prisons, and pious institutions. He died at Paris. How thoroughly his religious sentiments were governed by the theological tenets of his church may be perceived from these remarkable words which he uttered on his death-bed: 'It is highly reasonable that God be fully satisfied, and at least in purgatory I will suffer with patience and with love.' Several editions have appeared of the collected works of B. (as 16 vols., Versailles, 1812, and most recently in the *Panthéon Littéraire*, 3 vols., Par. 1838). The best edition of his sermons is that published under the care of Bretonneau (16 vols., and 18 vols., Par. 1707–34). His life was written by Madame de Pringy.

BOURDEILLES: see BRANTÔME.

BOURDON, n. *bôr'dŏng* [F. *burdon*, a pilgrim's staff—from mid. L. *burdo*, an ass: It. *bordone*, a staff, a prop]: the tall walking-staff used by pilgrims in the middle ages.

BOURDON, n. *bôr'dŏng* [F. *bourdon*, the drone stop of an organ, the drone of a dor-bee, etc.: Sp. *bordon*, the bass of an organ: Gael. *burdan*, a humming noise]: the drone of a bagpipe; an organ-stop of stopped wooden pipes, usually 8 ft. pipes giving a 16 ft. tone. In the pedal organ it is useful as a soft foundation stop; on the manual it is a 'double' stop. Also, a musical accompaniment: see BURDEN 2.

BOURDON, *bôr-dōng'*, Louis Pierre Marie: 1799-1854; b. Alençon: French mathematician. He took a course at the polytechnic school, became inspector of studies and member of the council of the univ. 1835. B. was not a man of genius but has a place among those who have popularized science. He published the following works, which are still classical: *Éléments d'algèbre* (1817) adopted by Prof. Davies of West Point, and widely known in this country; *Éléments d'arithmétique* (1821); *Application de l'algèbre à la géométrie* (1824); *Trigonométrie rectiligne et sphérique* (1854).

BOURDON DE L'OISE, *bôr-dōng' dĕh lwâz*, François Louis: b. St. Remy, near Compiègne, middle of 18th c.; d. 1797 or '98: notorious character of the French Revolution. He became a procurator in the parliament of Paris. He helped to storm the Tuileries, 1792, Aug. 10. He shortly afterward obtained a seat in the Convention by a trick, presenting himself as the regularly elected deputy for the dept. of Oise, in which he had actually been defeated by a namesake who was elected also for that of Loiret. The trick was subsequently discovered but he was not ejected. B. contributed much to bring about the execution of Louis XVI., the insurrection of May 31, and the destruction of the Girondists. He was sent to La Vendée, where, however, he loudly condemned the revolutionary cruelties, and appeared in the character of a moderate. Obnoxious on this account to Robespierre and Hébert, and fearing for his head, he urged on with the greatest eagerness the overthrow of the Terrorists on the 9th Thermidor (1794, July 27). From this time B. showed himself an enemy of the clubs, and a protector of the nobles and the priests. In consequence of the insurrection of 13th Vendémiaire (1795, Oct. 5), he was sent as commissioner to Chartres, where he behaved brutally. He passed from the Convention into the Council of Five Hundred, became a persecutor of the republicans, and joined a royalist club. The directory placed him upon the proscription list after the 18th Fructidor (1797, Sep. 4). He was transported to Cayenne, where, in a short time, he died in great misery, tortured with remorse.

BOURG, n. *bôrg* [F. *bourg*, burgh, a market-town]: a town or village; a municipality.

BOURGELAT, *bôrzh-lă'*, Claude: 1712–99; b. Lyon, France: founder of the first veterinary school and institutor of a distinct profession of veterinary surgeons. He was a learned lawyer, an able writer, and the bosom friend of D'Alembert. In his project to educate men for a scientific treatment of the ills of horses and other domestic animals, he found a friend and collaborator in a minister of Lyon, Bertin, and in 1761 the first veterinary school was opened in the suburbs of the city. It was patronized by royalty and students flocked to it from France, Italy, Switzerland, Germany, Sweden, and Denmark. From it all other veterinary colleges in Europe sprang, and it has kept pace with them—superior to the majority, and rivalling the very best, even those of Paris and Berlin.

B. wrote much, and his works on Farriery, Materia Medica, External Form, Contagious Diseases, and on the various apparatus and bandages used for quadrupeds, are still highly esteemed.

BOURG-EN-BRESSE, *bôrg-ŏng-brĕs:* town of France, capital of the dept. of Ain, pleasantly situated on the left bank of the Reyssouze, about 20 m. e.s.e. of Mâcon. It is well built, has several public fountains, a statue to Bichat, the celebrated anatomist, who was a student at the hospital here, a museum, a fine corn-market, and a public library of 19,000 vols. The distinguished astronomer, Lalande, was a native of B. It has manufactures of linen, cotton, hosiery, and leather, and a trade in agricultural produce. The town was captured by the allies, 1814. Pop. 18,500.

BOURGEOIS, n. *bôrzh-waw'* [F. a burgher—from *bourg*, a market-town]: in *France*, one of the middle order of inhabitants in towns, as distinguished from the nobility and gentry. Bourgeois, n. *bėr-joys'*, a kind of printing type in size between long primer and brevier: when it is set 'solid' nine lines fill a little more than an inch, and 1,000 *ems* of B. fill 13.86 sq. inches: see Type.

BOURGEOIS, Charles Arthur, Baron, French sculptor: b. 1838; d. 1886. He was a student of Duret and M. Guillaume. Among the more notable of his works are the *Arab Washerwoman*, and the *Greek Actor* in bronze; *St. Agatha; The Slave;* and *Hero and Leander*, in plaster; *The Delphic Pythos* and several busts in marble; and *St. Joachim* and *Religion*, two stone figures for the church of St. Eustache and the Church of the Sorbonne, respectively.

BOURGEOIS, Leon Victor Auguste, *lā-ŏn vek-tōr ô-goost*, French politician: b. Paris, 1851, May 21. After holding several positions of importance he became director of the ministry of the interior in 1886 and in 1887 prefect of police. He was minister of the interior in 1890; minister of public instruction 1890–92, and prime minister 1895–6. He was for a time in 1898 minister of public instruction for the second time, and in 1899 was at the head of the French delegation to the peace conference at The Hague. He has written *Solidarite* (1897).

BOURGEOIS, Sir Peter Francis, English painter: b. London, 1756; d. 1811, Jan. 8. At first intended for a military career, he soon determined to become an artist. In 1776 he went on a tour through France, Holland, and Italy, and three years later he exhibited his first picture. Elected A.R.A. in 1787, he became R.A. in 1793, and landscape painter to George III. in 1794. King Stanislaus of Poland in 1791 appointed him his painter and conferred on him the honor of knighthood, and shortly afterward George III. also knighted him. He bequeathed many pictures and a considerable sum of money to Dulwich College.

BOURGEOISIE, *bôrzh-waw-zē:* French term, now fre-

quently employed in English, German, and other languages, denoting a rank or class of society among the citizens of towns. It includes persons from the condition of heads of manufacturing or mercantile establishments down to master-tradesmen, and may be considered as a great middle class. The French B. have long been extremely hostile to the aristocracy, but have themselves latterly become the object of attack on the part of the working men and of the extreme radical or red republican party. The term *bourgeois*, from which B. is formed, is quite distinct in meaning from *citoyen*, the latter term designating a citizen of the state.

BOURGEON, v. *bėr'jŏn* [F. *bourgeon*, the young bud or sprout of a vine: Norm. F. *bourgeonner*, to bud—from O.H. G. *burjan*, to lift, as the bud is the first out-push of a tree in spring]: to sprout; to put forth buds; to shoot into branches. BOUR'GEONING, imp. BOURGEONED, pp. *bėr'jŏnd*.

BOURGES, *bôrzh:* capital of the dept. of Cher, France; in a fertile plain at the confluence of the Auron and the Yèvre, 144 m. s. of Paris. B. is divided into an old and new town, the latter built round the former. Its houses are of antique architecture, and its streets crooked and dirty. It was formerly surrounded by ramparts flanked with high towers, some of which remain; but the ramparts have been converted into promenades. B. has one of the noblest Gothic cathedrals in Europe, lighted by 59 splendid painted windows. Its university was suppressed at the Revolution. B. has greatly prospered since the railway has reached it. In 1861 it was chosen to be one of the military arsenals of France, and its strategical importance has become greater since the loss of Metz. B. is of great antiquity, being the *Avaricum* of the Gauls, in the country of the *Bituriges Cubi*. Taken by Cæsar, B.C. 52, it was afterward named *Bitu'rica*, and became cap. of the Roman province of *Aquitania Prima*. In the middle ages it was cap. of the province of Berri. Charles VII. had his residence at B., when almost all France had been taken from him by the English, and its Hôtel de Ville was originally the abode of his unfortunate minister, Jacques Cœur. Louis XI. was born at B. Of the seven ecclesiastical synods held at B., that of 1438—in which the Pragmatic Sanction of the Gallican Church was established with approbation of Charles VII., and the resolutions of the Council of Basel, relative to the papal power and the king's prerogatives, were confirmed—was the most important. Pop. 46,550.

BOURGET, *bôr-zhā*, PAUL, French novelist: b. Amiens, 1852, Sept. 2. After a brilliant course at the Lyceum of Clermont-Ferrand, where his father was professor of mathematics, and the College of Sainte Barbe, he graduated with high honors in 1872. He began to write in 1873, but it was 10 years before he found his true work, though he contributed, the while, numerous articles to the magazines,

and published three volumes of striking verse, *La Vie Inquiète* (1875); *Edel* (1878); and *Les Aveux* (1881). His *Essais* (1883) was the first indication of his strength. The second series, *Nouveaux Essais de Psychologie Contemporaine* (1886), was a singularly subtle and exceedingly searching inquiry into the causes of the pessimism then widely prevalent in France. Bourget's first novel, *L'Irréparable* (1884), was followed by *Cruelle Énigme* (1885); *Un Crime d'Amour* (1886); *André Cornélis* (1887), and *Mensonges* (1887). The keen insight into the hidden springs of human motive, and the marvelous subtlety of psychological analysis of these stories, together with their clearness and refinement of style, have lifted Bourget into the front rank of contemporary French novelists. His intimate knowledge of English and Italian life, and his travels in Spain and Morocco, gave him the material for *Sensations d'Italie* (1891); and *Cosmopolis* (1892); and he recorded his impressions (1894) of travel in the United States. Other novels are *Le Disciple; Notre Cœur; La Terre Promise; Un Saint; Antigone; Drame de famille Un Homme d'Affaires* (1901); *La fantôme* (1901); *Monique* (1902); *L'Etape* (1902); *L'Eau Profonde* (1904); *Un Divorce* (1905); etc. Bourget was admitted to the Academy in 1894.

BOURGOIN, *bôr-gwăng*, Edmé Alfred, French chemist: b. Saint Cyr-les-Colonne, 1836. In 1867 he became chief pharmacist of the Children's Hospital in Paris and has been director of the central pharmacy of the Paris hospitals from 1885. Among his writings are *Electro-chimie* (1868); *Chimie organique, Principes de la classification des substances* (1876); *Traité de Pharmacie galénique* (1880).

BOURGOING, Jean François, French diplomatist: b. Nevers, 1748, Nov. 20; d. Carlsbad 1811, July 20. While at a military school in Paris his talents were so marked that he was educated by the government at the University of Strassburg for the diplomatic service. After four years spent in Germany on diplomatic missions he went to Madrid in 1777 and was secretary of legation there seven years writing in that time his noted *Nouveau voyage en Espagne, ou Tableau de l'état actuel de cette monarchie* (1789). In 1791 he was minister plenipotentiary to Spain, minister to Saxony in 1808, and was at various times employed on diplomatic missions to Germany and Holland. Besides the work above named he wrote *Mémoires historiques et philosophiques sur Pie VI.* (1789).

BOURIGNON, *bô-rēn-yōng'*, Antoinette: 1616, Jan. 13—1680, Oct. 30; b. Lille, France; celebrated religious visionary. Her father was a merchant and she inherited from him a considerable patrimony. She was so ugly an infant that there was some thought of killing her as a monstrous birth. Her intellect, however, was very acute, and its powers were early developed, together with a tendency to religious mysticism, which was much encouraged by the reading of mystic books, till her imagination be-

came inflamed and she fancied that she saw visions, conversed with God, and was called to restore the pure spirit of the gospel. She won over some nuns, became the head of a party, and travelled in various countries, gaining proselytes by her enthusiasm. At last she was appointed head of a hospital in East Friesland. She died at Franeker. According to Madame B., religion consists in internal emotion, not in either knowledge or practice. Her own character exhibited a strange combination of pride and avarice, with a sort of mystic piety. She never gave anything to the poor, alleging as a reason that she had consecrated all to God. Some of her pretended revelations were of the most indecent nature; many of them were extremely ridiculous; yet many persons of intelligence and learning believed in them and adopted the peculiar form of mysticism which soon began to receive the name of Bourignianism. Among the chief expounders of it was Peter Poiret, a Calvinistic minister. It spread to a remarkable extent both among Rom. Catholics and Protestants, and about the end of the 17th c., and beginning of the 18th, prevailed so much in Scotland that a solemn renunciation of it was demanded from every entrant on the ministry at his ordination. A minister of Aberdeen was deposed for it 1701. The formal renunciation of Bourignianism is still continued in the Established Church of Scotland, but has been given up as needless by other Presbyterian churches. The works of Madame B. were edited by Poiret (25 vols., Amst. 1676–84; 2d edit. 1717). They exhibited not a little fiery eloquence.

BOURINOT, *bô′rĕ nŏt*, Sir John George, Canadian publicist: b. Sydney, Nova Scotia, 1838, Oct. 24.; d. 1902, Oct. 14. He was educated at Trinity College, Toronto; founded and edited the Halifax *Reporter*, became clerk of the Dominion parliament in 1880; was created a member of the Order of St. Michael and St. George in 1890; and in 1892 became president of the Royal Society of Canada. His publications include *The Intellectual Development of the Canadian People* (1880); *Manual of Constitutional History* (1888); *Parliamentary Government in Canada.* (1892); *Parliamentary Procedure and Practice* (1884); *How Canada is Governed* (1895); *Canada's Intellectual Strength and Weakness* (1893); *Canada Under British Rule* (1900); *Cape Breton and Its Memorials of the French Régime* (1892).

BOURKE, John Gregory, American military officer: b. Philadelphia, Pa., 1846, June 23; d. 1896, June 8. He was graduated at West Point in 1869, and saw much service against the Indians, rising through various grades to the rank of major. He became an expert in American ethnological lore; was a past president of the American Folk-lore Society, and wrote *Snake Dance of the Moquis, Medicine Men of the Apaches*, and other books. He distinguished himself on the Mexican border. He was an officer of great courage and ability.

BOURMONT, *bôr mawng,* Louis Auguste Victor de Gaisne, Count de: French marshal, conquerer of Algiers: 1773–1846, Oct.; b. at his paternal castle of Bourmont, in Anjou. He went into exile at the Revolution, served as an officer in the army of the Prince of Condé, and, 1793–96, was actively engaged in the anti-revolutionary struggle in La Vendée. Subsequently he obtained the favor of the first consul. Under the empire he was appointed to a colonelcy in the army of Naples and was soon raised to the rank of brig.-gen. In the campaigns of 1813, 14, he distinguished himself upon a number of occasions, particularly in the battle of Dresden and by the defense of Nogent, on account of which Napoleon promoted him to the rank of gen. of division. In 1814, March 31, he declared for the Bourbons and received the command of a military division during the first Restoration; yet, on Napoleon's return, he went over to him and was intrusted with the command of a division of the army of the Moselle. On the evening before the battle of Ligny he deserted and betook himself to Louis XVIII., at Ghent. There can be no doubt that B. was singularly ungenerous in choosing such a moment to resign, nor is there anything in his career to indicate any high principle in what he did. His evidence went a considerable way in bringing about the condemnation and execution of Marshal Ney (q.v.). He received high military employment under Louis XVIII. Distinguishing himself in the chamber of peers as a zealous supporter of the king, he was appointed minister of war, 1829, and in this office showed great activity. When the expedition against Algiers was undertaken, 1830, Apr., he received the chief command of the troops, and the rapid success of the expedition was ascribed to his prudence and energy. For this he received the marshal's baton July 22; but on the Revolution taking place in that month, he was superseded in his command and went to England to share the exile of Charles X. Refusing to take the legal oath, he was struck off the lists of the French army and peerage 1832. In 1833 Dom Miguel of Portugal placed him at the head of his troops, but the campaign was brief and unsuccessful. B. finally settled on his estate in Anjou and died there.

BOURN, or Bourne, n. *bôrn* [F. *borne,* a limit—from OF. *bonne,* bounds]: bounds; limits; confines; a goal.

BOURN, n. *bôrn* [AS. *burna,* a stream: Dut. *born;* Icel. *brunnr;* Goth. *brunna,* a spring, a fountain]: a small rivulet or water course: see Burn.

BOURNE, *bôrn,* Edward Gaylord, American educator: b. Strykersville, N. J., 1860, June 24. He was graduated at Yale in 1883, and has been professor of history there since 1895. He has written *The History of Surplus Revenue;* is one of the editors of the *Yale Review;* and published a collection of his writings on historical subjects under the title of *Essays in Historical Criticism.* Other writings include *Historical Introduction to the Philippine*

Islands (1903); *Spain in America* (1904); *Life of J. L. Motley* (1905). He has also edited Wooley's *A Two Years' Journal in New York* (1902); Fournie's *Napoleon I.* (1903); Rocher's *Spanish Colonial System* (1904); *The Chase Papers* (1903); and has edited and translated *The Narrative of De Soto* (1904); *The Voyages of Champlain* (1905); etc.

BOURNE, George, American clergyman and anti-slavery writer. b. Westbury, Wiltshire, England, 1780; d. New York, 1845, Dec. 14. In 1804 he settled at Harrisburg, Pa., where he set up a printing office. He was an earnest advocate of the total and immediate abolition of slavery, a position which aroused considerable opposition to him, and in 1815 he formed a church composed of non-slaveholders. His ultra-radical views at last obliged him to remove to Germantown. Afterward he resided for intervals at Sing Sing, N. Y., Quebec, and New York, where he founded a paper *The Protestant Vindicator*. He wrote: *The Book and Slavery Irreconcilable* (1815); *Lectures of Ecclesiastical History* (1822); *Pictures of Quebec* (1830); *Slavery Illustrated in its Effects upon Women* (1834).

BOURNE, Hugh: 1772, April 3—1852, Oct. 11; b. Fordhays, Staffordshire, Eng.: founder of the sect of Primitive Methodists. Originally a preacher among the Wesleyan Methodists, he was distinguished by the fervor of his religious sentiments, and by his zeal for the conversion of the ungodly. His enthusiasm for 'revivals' and open-air meetings, however, received no countenance from the leading clergymen of the denomination to which he belonged. In 1808, B. was cut off from the Wesleyan connection, strange to say, for following much the same course of earnest evangelization as Wesley himself had done. This did not daunt him. His preaching was wonderfully acceptable and he quickly gathered many devoted adherents. In 1810, Mar., a committee of 10 members was formed, which may be regarded as the first official organization of the body. In 1818, B. published in the *Primitive Methodist Magazine*, a narrative of his labors and of those of his coadjutors. In the course of his life he visited Scotland, Ireland, Canada, and the United States, where his ministrations were attended with great success. He died at Bemersley, in Staffordshire.

BOURNE, Vincent: b. abt. the close of the 17th c.; d. 1747, Dec. 2: one of the most elegant Latin versifiers that England ever produced. In 1714, he entered Trinity College, Cambridge; in 1721, he took his degree of A.M., and subsequently he was appointed usher in Westminster School. It would be difficult to praise too highly B.'s exquisite contributions to Latin poetry. They bear comparison, not only in point of Latinity but also in point of originality, with the choicest productions of the ancient Roman poets. A gracefulness which pervades thought, sentiment, and expression, is their essential characteristic.

The subject is, indeed, often insignificant, but the treatment is always perfect. His translations of English ballads and other lyrics into Latin are wonderfully felicitous, every beauty being retained with the most delicate skill, and every defect most carefully remedied. Cowper, Beattie, Charles Lamb, and others have expressed their admiration of B.'s singularly fine *genius*. The first edition of B.'s poems appeared 1734.

BOURNEMOUTH, *bōrn′mŭth*, a famous watering-place in the south of England, 30 miles southwest of Southampton, on the English Channel, at the southwest corner of Hampshire, near the boundary of Dorsetshire. It is within the limits of the parliamentary borough of Christchurch, but forms a municipal borough by itself. It is situated on a semicircular bay at the mouth of a small stream, the Bourne, whence it derives its name. It has become very popular as a seaside resort for consumptive and other delicate persons. It is to a large extent laid out in villas and detached houses. The Westover Gardens in the centre of the town are a favorite resort; they include a winter garden, where orchestral concerts are regularly given. There are two piers, three arcades, assembly rooms, baths, etc. The buildings include hospitals, a sanatorium, home for consumptives, and some handsome churches, among the latter being the new Bennett Memorial church and St. Peter's church, both beautiful Gothic buildings. In the churchyard of the latter lie buried William Godwin, Mary Wollstonecraft, and their daughter, the wife of Shelley. Pop. (1901) 47,000.

BOURNONITE, n. *bôr′nō-nīt* [after Count *Bournon*]: a mineral of a steel-gray color, a triple sulphate of antimony, lead, and copper—sulphur, 19.4; antimony, 26; lead 41.8; copper, 12.8—known also as *endellionite*.

BOURNOUS′: see BURNOOSE.

BOURRANS, n. *bôr′ănz* [Russ. *borei*, the n. wind]: the name given to the fierce snow storms that blow from the north-east over the *steppes* of Russia.

BOURRIENNE, *bô-re-ĕn′*, LOUIS ANTOINE FAUVELET DE., sec. and early friend of Napoleon I.: 1769, July 9—1834, Feb. 7; b. Sens, France. He received his education in the military school at Brienne, where he formed the closest intimacy with the future emperor. He became, 1792, sec. to the embassy at Stuttgart. Deprived of this office by the breaking out of war, he lived for some time a rather retired life, until, 1797, his former schoolfellow appointed him his secretary. He accompanied him to Egypt and to Italy, and in 1801 was nominated a councilor of state. In 1802 he was dismissed from his office for being implicated in the dishonorable bankruptcy of the house of Coulon, army-contractors, but in 1805 he was appointed ambassador to the States of the Circle of Lower Saxony, and in this capacity resided long at Hamburg. His tendency to peculation, however, necessitated his return to France, where he had to refund 1,000,000 francs

into the public treasury. He now decidedly joined the party which sought the overthrow of the emperor and the restoration of the Bourbons. He was treated with little consideration by them during the first restoration, yet he followed Louis XVIII. in his flight to the Netherlands upon Napoleon's return, and upon the second Restoration was honored with the title of a minister of state. As deputy from the dept. of Yonne, 1815 and 1821, he showed his weakness of character by opposing all liberal measures, and even institutions for the promotion of science and popular education. The revolution of 1830 and the loss of his fortune (occasioned by extravagance) caused his reason to give way, and he died in a lunatic asylum at Caen. His Memoirs concerning Napoleon, the Directory, the Consulate, the Empire, and the Restoration (*Mémoires sur Napoleon*, etc., 10 vols., Par. 1829), gave many new explanations of the events of his time, but were declared by contemporaries to be in many respects untrustworthy: see BOULAY DE LA MEURTHE. The work, however, must always constitute an important part of the materials of history. A work entitled *Histoire de Bonaparte par un Homme qui ne l'a pas quitté depuis 15 Ans*, has been erroneously ascribed to him.

BOURSE, n. *bôrs* [F. *bourse*, a purse, exchange—from mid. L. *byrsa*: Gr. *bursa*, a hide, a skin]: place where merchants meet; the Exchange in towns on the European continent, particularly in Paris: see EXCHANGE.

BOURTREE, or BOORTREE, n. *bôr'trē:* in *Scot.*, the elder-tree.

BOUSE, BOOSE, or BOOZE, v. *bôz* [Dut. *buizen;* Swiss, *bausen*, to drink deeply: Ger. *bausen*, to swell or puff out: Gael. *busach*, one having a large mouth—from *bus*, a mouth —*lit.*, to supply the mouth too frequently with strong drink]: to drink intoxicants deeply; to guzzle; to carouse: N. the act of drinking long and deeply; a carouse. BOUSING, imp. *bôz'ĭng*. BOUSED, pp. *bôzd*. BOUSY, a. *bô'zĭ:* see BOOSE 1: also spelled BOUZE and BOOZE.

BOUSSA, *bôs'sâ:* town of Sudan, central Africa, cap. of the dist. of Boussa, on an island in the Niger; lat. 10° 14′ n., long. 5° 20′ e. It is hemmed in by rocks, and being also surrounded by walls, is a place of considerable strength. A melancholy interest attaches to B. as the death-scene of Mungo Park (q.v.). Pop. estimated 10,000–18,000.

BOUSSINGAULT, JEAN BAPTISTE JOSEPH DIEUDONNÉ, *bô-săng-gō*, French chemist: b. Paris, 1802, Feb. 2; d. there 12 May 1887. He went to South America in the employment of a mining company, and made extensive travels and valuable scientific researches there. Returning to France he became professor of chemistry at Lyons in 1839, was made a member of the Institute, and then made Paris his chief residence. His works deal chiefly with agricultural chemistry, and include *Economie Rurale* (translated into English and German); *Mémoires de Chimie agricole et de Physiologie; Agronomie, Chimie agricole, et Physiologie*, etc.

BOUSSOLE STRAIT, *bô-sol′:* passes through the Kurile Islands, uniting the Sea of Okhotsk and the Pacific Ocean; lat. 46° 30′ n. It takes its name from one of the vessels of La Perouse, who, soon after Cook's death, emulated, on the n.e. coasts of Asia, that navigator's explorations on the n.w. shores of America.

BOUSTROPHEDON, *bow-stro-fē′don* [Gr. *bous*, an ox and *strepho*, I turn]: term for a mode of writing practiced by the Greeks in their earlier history—in which the lines did not proceed uninterruptedly from left to right, but alternately, the first line being written from right to left, the second from left to right, etc. Examples are frequent in coins and inscriptions. The method received its name from its resemblance to the path made by oxen in ploughing a field.

BOUT, n. *bowt* [Dan. *bugt*, a bend, a turn: Icel. *bugtha*, a bend: Goth. *biugan*, to bend: Eng. *bight*]: as much as can be done at one turn; an attempt; applied to a drinking-match, or a debauch, as a *drinking-bout.*

BOUTADE, n. *bô-tâd′* [F. *boutade*, an attack, a push—from *bouter*, to push]: in *OE.*, a whim; a caprice; a sudden fancy.

BOUTEFEU, n. *bôt′fô* [F. *boutefeu*, a linstock—from *bouter*, to set or push; *feu*, fire]: in *OE.*, an incendiary; a kindler of feuds.

BOUTELLE, *bô-tĕl′*, Charles Addison: journalist and statesman; 1839, Feb. 9—1901, May 21; b. Damariscotta, Me. He was educated at the Acad. in Yarmouth, and was in the shipping business for a time; entered the navy as a volunteer 1862, and served through the civil war. In 1870 he became manager of the *Whig and Courrier* at Bangor; in 1880 received a unanimous nomination as a republican congressman, and was re-nominated, and re-elected for continuous service till 1895. As chairman of the committee on naval affairs in the 51st congress, he drafted the bill which provided the new navy with its first heavy battle-ships. He served on the repub. nat. committee 1884.

BOUTERWEK, *bô′tĕr-vĕk*, Friedrich: 1766, Apr. 15—1828; b. Oker, near Goslar, in the Hartz dist.: German philosophical and æsthetical author. He first studied law, then poetry, then turned to philosophy, and the history of literature. In philosophy, he followed first Kant, afterward Jacobi. He became extraordinary prof. of philosophy in Göttingen, 1797, ordinary prof. 1802. His great work is *History of Modern Poetry and Eloquence* (*Geschichte der neuern Poesie und Beredsamkeit*, 12 vols., Gött. 1801–19,) one of the best German works of its kind, and specially valuable on Spanish literature.

BOU′TON, John Bell, American author: b. Concord, N. H., 1830, March 15; d. Cambridge, Mass., 1902, Nov. 18. He edited the Cleveland *Plain Dealer* 1851–5, and was connected with the New York *Journal of Commerce* 1857–89. He contributed for ten years to Appleton's

Annual Cyclopedia, and published *Loved and Lost* (1857); *Round the Block* (1864); *Treasury of Travel and Adventure; Round about Moscow* (1887); *Uncle Sam's Church* (1895); *Memoirs of General Bell* (1902).

BOUTS, *bowts*, DIRK, or DIERICK. Dutch painter: b. Haarlem, about 1410; d. 1475. He was a brilliant colorist and one of the most prominent members of the Flemish school. Among his works are the *Martyrdom of St. Erasmus* in the Church of St. Peter, Louvain; and the *Martyrdom of St. Hippolitus* in the cathedral of Bruges.

BOUTS-RIMÉS, *bô-re-mā'* [Fr. rhymed endings]: a kind of verses in which the final rhymes are given out by one member of a party, and the lines are then filled up by others to suit the endings. Suppose the rhymes prescribed are *wave, lie; brave, die;* the following are two of the ways in which the lines might be completed:

Dark are the secrets of the gulfing — wave,
Where, wrapped in death, so many heroes — lie;
Yet glorious death's the guerdon of the — brave,
And those who bravely live can bravely — die.

Whenever I sail on the — wave,
O'ercome with sea-sickness I — lie;
I can *sing* of 'the sea,' and look — brave;
When I *feel* it, I *feel* like to — die.

BOUTWELL, *bowt'wel*, GEORGE SEWALL, LL.D.: statesman: 1818, Jan. 28—1905, Feb. 28; b. Brookline, Mass. As a boy he worked on his father's farm; entered a store in Groton, Mass., 1835, as a clerk; meanwhile he studied law and was admitted to practice. He became a partner in the establishment where he had been employed, and continued there until 1855. He strongly supported Van Buren for the presidency 1840, was elected as a democrat to the Mass. legislature 1842, and was continuously re-elected until 1851. During this period he ran for congress several times, and for gov. twice, but was defeated until 1851, when he was elected to congress, and re-elected the following year. He assisted in organizing the republican party, was a member of the republican national convention which nominated Lincoln 1860, and a member of the peace conference at Washington 1861. In 1862, at the request of Pres. Lincoln, he organized the new internal revenue dept., becoming its first commissioner, and holding the position 1862, July—1863 Mar. He was elected to congress from Mass. 1862, and twice re-elected, and was one of the managers of the impeachment trial of Pres. Andrew Johnson. Pres. Grant appointed B. sec. of the treas. 1869, Mar. He resigned 1873, Mar., having been elected senator from Mass. to fill the unexpired term (1873-77) of Vice-Pres. Wilson. In 1877 Pres. Hayes appointed him to codify the statutes at large, and he eventually settled in Washington, D. C., where he practiced law. Besides numerous speeches he published *Educational Topics and Institutions* (1859); several works concerning taxation; *The Constitution of the United States at the End of the First Century* (1896); *Reminiscences of Sixty Years in Public Affairs*

(1902). After 1898 he was especially prominent as a leader of the Anti-Imperialists and vigorous opponent of the Philippine policy of the administration.

BOUVARD, *bô vâr*, JOSEPH ANTOINE, French architect: b. Saint-Jean-de-Bournay, 1840, Feb. 19. He was a pupil of Constant Dufeux, whom he assisted in his work connected with the Panthéon, the Law School, and the Palace of the Luxembourg. He was appointed inspector of public works in Paris, and, in 1879, was city architect, making himself famous by his work on the Théâtre Lyrique, the Church of St. Lawrence and the barracks of the Republican Guard. He transformed the old grain market into a Bourse; constructed the railway stations of Sainte Etienne and Marseilles; was architect of the Pavilion of the City of Paris at the exposition of 1878; and created the magnificent central dome of that of 1889. He had charge of the decoration of Paris at the time of the visit of the emperor of Russia, and won great popularity by the magnificence of the festivals which he arranged. In June 1897 he was appointed director of the newly created administrative direction of architecture and promenades. He was made an officer of the Legion of Honor in 1889. He took an important part in the preparation for the Universal Exposition of 1900, being director of the architectural services and chief of the management of fetes, under M. Picard.

BOUVAR'DIA: genus of plants of the nat. ord. *Rubiaceæ*, related to the *Cinchona* (q.v.), or Peruvian Bark. The calyx is 4-partite, with teeth between the segments, the corolla tubular and 4-fid; the stamens 4, included within the corolla; the capsule 2-celled. The species are natives of Mexico. One of them, *B. triphylla*, with oblong ternate leaves and trigonous branches, has obtained a place among favorite ornaments of flower-borders, but requires careful protection from frost. To preserve it the roots are generally taken up and are sometimes placed in a greenhouse or frame for the winter—sometimes in a dry cellar. Its beautiful corymbs of scarlet flowers are produced from June till November.

BOUVART, or BOUVARD, *bô-vär*, ALEXIS, Swiss mathematician and astronomer: b. Haute Savoie, 1767, June 27.; d. 1843 June 7. He went to Paris about 1785 to study mathematics and astronomy, and in 1793 obtained a position in the Paris Observatory. He is celebrated for his researches in the theory of planetary motions, especially those of Jupiter and Saturn. Later he took up the theory of Uranus, and was the first to suggest that the discrepancies between the old and new observations could only be reconciled by the hypothesis of another undiscovered disturbing planet, an opinion which he retained till his death, three years before the discovery of Neptune. He published *Nouvelles tables de Jupiter et de Saturne* (1808); *Mémoire sur les Observations Meteorologiques, faites à l'Observatoire de Paris.*

BOUVÉ, Pauline Carrington, American novelist: b. Little Rock, Ark.; married Thomas Tracy Bouvé in 1898. Besides the historical novel *Their Shadows Before* (1900); the serials *Pilate's Wife* in Fetter's *Southern Magazine* (1893); *Ole Miss* in Philadelphia *Sunday Mercury* (1895); *Stories of American Heroes for Boys and Girls* in the *Brown Book* (1902); *Miracle Stu[illegible] of Scienc* (1903); *Brunetiere versus Realism* (1904); etc., she has published *La Toison d'Or* from the French of Amedée Achard (1900).

BOUVET, *bô-vā′*, Joachim: d. 1732, June 28: learned French Jesuit, one of a company of 6 sent by Louis XIV. to China to acquire information concerning that country, 1686. B. gained the special confidence of the emperor at whose request he brought 10 more missionaries in 1699.

BOUVET, Marie Marguerite, American writer of books for young people: b. New Orleans, 1865, Feb. 14. She has published *Sweet William* (1890); *Little Marjorie's Love Story* (1891); *Prince Tip-Tip* (1892); *My Lady* (1894); *A Child of Tuscany* (1895); *Pierette* (1896); *A Little House in Pimlico* (1898); *Tales of an Old Château* (1900); *Bernardo and Lauretta* (1902); *The Fortunes of Clothilde* 1903).

BOUVIER, *bô-vēr′*, Fr. *bô-vĕ-ā′* John: 1787–1851; b. at Codognan, France: jurist and author. He came to America about 1802, studied law, settled in Philadelphia, and became judge of the court of criminal sessions in 1838. He published: a *Law Dictionary* (1839, 2 vols.), and *Institutes of American Law* (1851, 4 vols.), both valuable works with high reputation.

BOVALI, *bo-vâ′le*, or Boali, *bo-â′lē:* town in Africa, cap. of the kingdom of Loango, on the river Bovali, near the Atlantic coast; lat. 4° 30′ s., lon. 12° 1′ e. It is in a productive but unwholesome region. Its exports are ivory, pepper, dye-woods, and slaves. Pop. about 15,000.

BOVEY, *bō′vĭ*, Henry Taylor, Canadian engineer: b. Devonshire, England. He was educated at Cambridge University and took up the profession of civil engineering. He was appointed professor of civil engineering and applied mechanics in McGill University in Montreal in 1887 and since has lived in Canada. He is a member of many professional societies both in England, Canada, and the United States, and is the author of *Applied Mechanics* (1882); *Theory of Structures and Strength of Materials* (1893); *Hydraulics* (1895).

BOVEY COAL, a form of wood-coal or lignite, named from Bovey, Devonshire, Eng., where it is found.

BOVIDÆ, *bō′vĭ-dē* [Lat. *bos*, an ox]: family of ruminating mammalia (see Ruminantia); division *Cavicornia* (hollow-horned), or, by others, last of 3 sub-divisions—viz., Antilopidæ, Ovidæ (sheep and goats), and Bovidæ (oxen), to which last it may be confined in this article. The B. are all large animals, with stout limbs and broad muzzle. The facial outline is nearly straight. Their dentition agrees with that of some of the other ruminants, as

1. Celebes Wild Ox or Anoa. 2. North American Bison or Buffalo.
3. Indian Domestic Buffalo.

sheep, goats, and antelopes; they have eight cutting-teeth in the lower jaw and none in the upper, but instead of them a fibrous and elastic pad, which covers the convex extremity of the anterior maxillary-bone; they have no canine teeth, but a large interval between the cutting-teeth and the grinders, which are six on each side in each jaw. The chewing of a cud is an important characteristic of the B. Both sexes are furnished with unbranched, tapering horns, directed more or less laterally, and generally upward and forward, and usually curved through their whole length. There are, however, breeds of the common ox, in which both sexes are destitute of horns. The tail is rather long and terminated by a tuft of long hair. The females have four teats. All the B. are gregarious. Native species are found in Europe, Asia, Africa, and N. America. Fossil remains of species which no longer exist have been found in pliocene and pleistocene deposits. The number of existing species is not certain, as, beside the difficulty of deciding in some cases what are to be deemed species and what merely varieties, there is still great deficiency of accurate information concerning the B. of different parts of the world. The very magnitude of the animals has probably prevented so frequent a comparison of specimens as would otherwise have taken place. It has recently been ascertained that the number of species is larger than had been supposed. Attempts have been made to divide the genus *Bos* into several genera, but they are not very clearly nor strongly distinguished. All the B. are valuable to man for their flesh, tallow, skin, etc.; but some of them, having long been reduced to domestication, are among the most valuable of all domestic animals, particularly the common ox, different kinds of buffalo, and the yak of Tatary.—See Arnee: Banteng: Bison: Buffalo: Gaur: Gayal: Galla Ox: Musk Ox: Ox: Pegasse: Urus: Yak: Zamouse: Zebu: etc.

BOVINE, a. *bō′vīn* [L. *bovem*, an ox]: pertaining to animals of the ox kind. Boviform, a. *bō′vĭ-fawrm* [L. *forma*, shape]: resembling the ox.

BOVINES, or Bouvines, *bô-vēn′*: village of France on the Marq, seven m. s.e. of Lille, remarkable for a great battle, 1214, July 27, in which Philip Augustus, King of France, with about 75,000 men defeated Otho IV., Emperor of Germany, and his allies, whose combined force is variously reported to have numbered from 100,000 to 200,000 men (the last number undoubtedly an exaggeration). This great victory contributed more than any other to the unity and freedom of France, which had been continually menaced by feudalism and ambitious foreigners.

BOVINO, *bō-vē′nō:* fortified town in the province of Foggia, s. Italy, about 20 m. s.s.w. of Foggia. It is the see of a bishop, has a cathedral, churches, and convents. The valley of B. was formerly notorious as the haunt of the brigands of Capitanata, and the town still has the unenviable reputation of being the nursery of all the high-

way robbers of this portion of the Apennines. B. occupies the site of the ancient *Vebinum*. The Imperialists defeated the Spaniards here 1734. Pop. 7,900.

BOW, v. *bow* [AS. *beogan;* Icel. *buga;* Dut. *buigen;* Goth. *biugan*, Ger. *beugen*, to bend]: to bend; to bend the body in token of respect; to crush; to depress; to stoop: N. an act of respect by bending the body, or by inclining the head; a bend. BOW'ING, imp.: N. the act of one who bows. BOWED, pp. *bowd.*

BOW, n. *bō* [Ger. *bogen*, a bow, curve: Icel. *bogr;* Sw. *bog*, bow of a ship: W. *bog*, a swell, a rising up: Gael. *bogha*, a curve—from *bogh*, to bend: AS. *boga*, a bow, an arch]: anything curved or arched; an instrument for shooting arrows with; a name given to various instruments having a curved form, as a *violin-bow;* the curved doubling of a ribbon or string in a slip-knot; in *OE.*, an ox-yoke: ADJ. curved or arched, as a *bow-window.* BOW, *bō*, or BOWS, *bowz*, n. the rounding fore part of a ship. BOW-BEARER, *bō-*, an under-officer of a forest, who looked after trespasses affecting 'vert or venison.' BOW-CHASER, *bow-*, a gun that can be fired from the bow of a ship in chasing another. BOW-COMPASS, *bō-*, a beam of wood or brass, with three long screws, that bend a lath of wood or steel to an arch. BOW-GRACE, n. *bow'grās*, a frame of old rope or junk placed round the bows and sides of a vessel to prevent injury from ice. BOW'LEGGED, a. *bō-*, having crooked legs; bandy-legged. BOWLINE, n. *bow'lĭn*, also spelled BOWLING, *bow'lĭng*, or BOLIN, *bō'lĭn*, in *nav.*, a rope fastened near the outer or perpendicular edge of a square sail leading toward the bow, to tighten the sail and enable the ship to keep near the wind. BOWMAN, n. *bow'măn*, the man who rows the foremost oar in a boat; *bō'măn*, an archer. BOW'NET, n. *bow-*, an engine made of wicker-work for catching lobsters, crawfish, etc. BOW PEN, *bō-*, a sort of pen for ruling lines on paper, etc., consisting of two metallic sides bowed or curved, but made to meet at a point for holding the small dip of ink. BOW-SHOT, n. *bō-*, the space over which an arrow may pass when shot from a bow; a place not far distant. BOWSPRIT, n. *bow'sprĭt*, or BOLTSPRIT, an erroneous spelling [*bow* and Dut. *spriet*, properly a piece of cleft wood, the yard of a sail: Gael. *spreòd*, a projecting beam]: a large boom, spar, or mast, which projects over the stem or head of a ship. Its use is to carry sail forward, as a means of counteracting the effect of the after-sails, and keeping the ship well balanced. It is also a support of the fore-mast, which is fastened to it by large stays or ropes. In ordinary ships of war, the bowsprit rises at an angle of about 45° from the horizon, and is generally about two-thirds as long as the mainmast; but in many kinds of vessels the position is more nearly horizontal. BOW-SAW, *bō-saw*, a flexible saw for cutting curves. BOW-STRING, n. *bō-*, string of a bow; a string or cord used by the Turks in putting criminals to death by strangling them. BOW-WINDOW, n. *bō-*, a window of a semicircular form; a bay-window. ON THE BOW, *bow*, seen over the

bow of a ship within 45° on either side of the prow. ON A BOW LINE, *bow*, said of a ship sailing close to the wind, or close-hauled. TWO STRINGS TO HIS BOW, *bō, two* means to accomplish the end in view, if the one fails he can try the other—alluding to archers carrying reserve strings for their bows. *Note.*—The two preceding entries are identical in their etymology though differently pronounced. The confusing and perplexing variations in the pronunciations of this paragraph might well have warranted separate entries, had it been at all practicable or desirable.

BOW, of a Ship: general name for the forepart, or that which breasts the waves. Very often the word is used in the plural, the ship being considered to have starboard and larboard, or right and left bows, meeting at the prow or figure-head. A narrow or *lean* bow and a broad or *bluff* bow are seamen's phrases for different shapes of bow, each of which has its own peculiar advantages at sea; a narrow bow will cut more smoothly through the water, but a broad bow bears up more firmly in a high sea.

'On the bow,' in sea-language, is the position of a distant object when seen over the bow; it implies a sweep of one quarter of the horizon, embracing about 45° on each side of the prow or head.

BOW AND ARROW: the earliest instruments known, and the most generally diffused among all savage and barbarous peoples for use in hunting or in war. There are two forms of bow, the long-bow and the cross-bow, the former of which is the earlier, the more general, and the more celebrated. Whatever the substance of which the bow is made, wood, horn, or steel, its figure is nearly the same in all countries, having generally two inflexions, between which, in the place where the arrow is fixed, is a right line. Some of the North American Indians, especially the Comanches and the Apaches, were very expert with the bow.

For the military place of bowmen in armies of the middle ages, see ARCHERS and ARCHERY. For description of the cross-bow see ARBALEST. The long-bow gained ascendency in England in the 14th c. It was found that a dozen arrows could be discharged from this weapon while the arbalester was winding up his cumbrous cross-bow and discharging one arrow or quarrel from it. Moreover, the long-bow being held vertically, the bowmen were able to stand in closer array than the arbalesters; they were enabled, also, to take a greater supply of the munitions of war into the field, seeing that the bow and arrows were much lighter in weight. Some of the bows had two arches, connected by a middle straight piece. The best length was regarded as about 5 ft. 8 in. from nock to nock, but in earlier times some of the bows were much longer. The first arrows were made of reeds; these materials were superseded by cornel-wood; but the wood finally adopted as the best was ash. The arrows had heads pointed with

steel, sometimes barbed to render their action more terrible. They were feathered with portions of goose-wing. The best length of arrow for a bow of the above-named size was set down at 2 ft. 3 inches. Sometimes the arrows were tipped with combustibles. The best makers of arrow-heads, as well as bows, were compelled by law to go from town to town, to exercise their craft wherever it was most needed. The bowman usually carried 24 arrows, called a sheaf, or a quiver, at his right side or at his back, besides others in his girdle.

BOWDICH, *bow'dĭch*, THOMAS EDWARD: 1790, June—1824, Jan. 10; b. Bristol, Eng.: African traveller. He was first engaged in trade in his native city, but afterward appointed a writer in the service of the African Company. Selected, 1816, to conduct a mission to the king of Ashantee, he published an account of it, 1819, 4to. On his return to Europe he resided some years in Paris. To obtain funds for a new exposition into the interior of Africa, he published a translation of Mollien's *Travels to the Sources of the Senegal and Gambia*, and other works, and 1822, Aug., sailed from Havre. He died of fever on the river Gambia. A profound scholar and accomplished linguist, B. was a member of several literary societies in England and on the continent.

BOWDITCH, NATHANIEL: 1773, Nov. 26—1838, Mar. 16; b. Salem, Mass.; American astronomer. He showed at a very early age a great inclination for mathematics, in which he afterward made great proficiency, without the advantages of a collegiate education. He was at first trained to his father's trade of a cooper, and afterward apprenticed to a ship-chandler. He acquired Latin that he might study Newton's *Principia*. He gave especial study to the practical applications of science. He went as supercargo of a merchant-ship in several long voyages, and added a thorough practical acquaintance with navigation to a theoretical knowledge of it. His work, *The American Practical Navigator*, was received with great favor. He published also an admirable translation of La Place's *Mécanique Céleste* (2 vols., Boston, 1829), to which he added valuable annotations. These works obtained marks of honor from scientific societies in Britain, and led to his being called to the professorship of mathematics and astronomy in Harvard College, which, however, he declined, in order to enter the executive council of the state. He afterward became manager of the Massachusetts Life Insurance Assoc., pres. of the Mechanics' Institute, and pres. of the Acad. of Arts and Sciences in Boston.

BOWDOIN, *bō'd'n*, JAMES, LL.D.: governor of Massachusetts: 1727–90; b. Boston, son of Pierre Baudoin, a Huguenot, who fled from Rochelle, France, to New England 1687. He graduated at Harvard (1745) and contributed much by writing and speech to sustain the zeal of his fellow-patriots in the war for independence. He was elected pres. of the colonial council of government,

1775, and became gov. 1785, being the successor of John Hancock. He showed executive ability by a prompt suppression of Shay's rebellion (1786–7). B. was a member of the convention that ratified the federal constitution in 1789. After the impairment of his health had obliged him to quit public functions he devoted his time entirely to the sciences and literature. He was an associate of Franklin; one of the founders, and for a long time pres. of the Acad. of Arts and Sciences at Philadelphia, to which he also presented his library. His name was given to the first college in Maine.

BOWDOIN, James: 1752–1811: son of Gov. B. He graduated at Harvard, was for some time a student at Oxford, and travelled in Europe, returning to his native country shortly after the battle of Lexington. In 1805, he was appointed minister to Spain, one of the objects of his mission being to negotiate the cession of Florida to the United States. To Bowdoin College, named after his father, he left 6,000 acres of land, besides the island of Naushon, his library, and a large collection of philosophical apparatus.

BOWDOIN COLLEGE: oldest and one of the most prominent educational institutions in Maine; in the town of Brunswick, on the right bank of the Androscoggin river, near the ocean. It was named after Governor James Bowdoin, and received (1794) its charter from the legislature of Massachusetts, of which state Maine formed then a part. The charter declared that the object of the institution was 'to promote virtue and piety, knowledge of the languages, and of the useful and liberal arts and sciences.' The government, as then formed, consisted of a board of trustees, and a board of overseers. In 1801 Joseph McKeen, a graduate of Dartmouth, was elected as the first pres., and John Abbott, a Harvard graduate, as prof. of languages. Eight students were admitted, 1802, and four years later, the new college bestowed its first honors upon eight graduates. At that time the whole college, including the residences of the professors, occupied but one building. James Bowdoin, the younger, who had given the college about $5,000 and 1,000 acres of land, gave before his death more land, also books, paintings, and mineralogical specimens. In 1906 it had 54 professors and instructors, 368 students, 91 scholarships, 82,000 volumes in the library, scientific apparatus at $100,000, grounds and buildings $500,000, productive funds $629,000, receipts from tuition $31,090. The recent benefactions have been large. The buildings include Massachusetts Hall (the original building), King Chapel, Memorial Hall, Mary Francis Searle Science Building, Walker Art Building, Hubbard Hall (the library), Adams Hall, Observatory and the Sargent Gymnasium. An interesting feature of the library is the provision of an alumni alcove, devoted entirely to the published works of graduates of the college. The library also contains framed and in cases a collection of

drawings, which has been pronounced the finest in the country after that in the Metropolitan Museum of Art in New York. Among noteworthy graudates were Nathaniel Hawthorne and Henry W. Longfellow, William Pitt Fessenden, Geo. B. Cheever, D.D., Franklin Pierce (pres. United States), John P. Hale, and Thomas B. Reed. Longfellow was for some time prof. of languages. The curriculum comprises the branches usually studied in American colleges and after the freshman year the work of the regular course is almost entirely elective. There is a scientific course, also, to which instruction in shop-work was added in 1902. There is also a post-graduate course of two years in the study of philosophy and the arts. There is also provision made for military instruction. Graduates who have honorably completed a post-graduate course may receive the appointment of resident Fellows, and enjoy all the privileges for two years longer without further charge. In addition to the college proper, the institution includes the Medical School of Maine, founded in 1820.

BOWELL, Sir Mackenzie, Canadian statesman: b. Rickinghall, Suffolk, England, 1823, Dec. 27. He went to Canada when 10 years old and learned the printing trade, became editor of the Belleville *Intelligencer*. He served in the Canadian militia. After the Confederation he served in the Dominion House of Commons for 25 years. In 1878 he entered the MacDonald Cabinet, and in 1894 formed an administration of his own. He relinquished Cabinet office in 1896, and in 1897 he declared his independence of all party affiliation.

BOWELS, n. plu. *bow'elz* [OF. *boēl*, a gut, a bowel: F. *boyau*, from mid. L. *botel'lus*, an intestine: It. *budello*, a gut]: entrails: intestines; tenderness; pity; compassion; interior, as bowels of the earth; among *surgeons*, used often in the singular, Bowel. Bow'el, v. to take out the entrails. Bow'elling, imp. Bow'elled, pp. *-ĕld*, having bowels or a belly; having had the bowels taken out. Bow'elless, a. without tenderness or pity—the bowels being anciently considered the seat of pity.

BOWEN, *bō'ėn*, Francis, LL.D.: author: 1811, Sep. 8, —1890, Jan. 21; b. Charlestown, Mass. He graduated at Harvard 1833, and was instructor in intellectual philosophy and political economy in that univ. 1835–39; then spent two years in Europe. Soon after his return to America he became editor of the *North American Review*, a position which he held nearly 11 years. He lectured on metaphysical and ethical subjects before the Lowell Inst., Boston: and 1850 lectured also on political economy. B. was appointed 1853 Alford prof. of nat. religion, moral philosophy, and civil polity at Harvard. From 1858 he lectured before the Lowell Inst. on the English metaphysicians and philosophy from Bacon to Sir William Hamilton. In his philosophical works B. opposed the systems of Kant, Fichte, Cousin, Comte,

and John Stuart Mill. In polit. economy he opposed the free-trade doctrines of Adam Smith, Malthus in his ideas on population, and Ricardo in his views of rent. Among his works are: *Documents of the Constitutions of England and America, from Magna Charta to the Federal Constitution of* 1789 (1854); *The Principles of Metaphysical and Ethical Science applied to the Evidences of Religion* (1855); *Dugald Stewart's Philosophy of the Human Mind, with Critical Notes* (1854); *Principles of Political Economy* (1856); *The Metaphysics of Sir William Hamilton* (1862); *De Tocqueville's Democracy in America, edited with notes* (1862); *Logic, or the Laws of Pure Thought* (1864); *American Political Economy* (1870); *Modern Philos. from Descartes to Schopenhauer and Hartmann* (1877).

BOWEN, Henry Chandler: publisher: 1813, Sep. 11—1896, Feb. 24; b. Woodstock, Conn. He was educated at Woodstock Acad.: was in mercantile business many years; was collector of internal revenue under Pres. Lincoln; was the owner and publisher of *The Independent* for many years; and after the close of the civil war held annual receptions on July 4 at his Woodstock farm, where the most eminent men in the country united in patriotic exercises. He purchased *The Independent* when its circulation was small, and made it a valuable and influential property. Theodore Tilton was editorially connected with it 1856–71, and in the latter part of this period was editor-in-chief, succeeding Henry Ward Beecher. Bowen was one of the founders of Plymouth Church, Brooklyn; but, 1875–6, having been understood to make the gravest charges against its pastor, he was called to substantiate them; and after full hearing it was voted that he had failed to do this, and his connection with the church was terminated.

BOWEN, Herbert Wolcott: an American diplomatist; b. 1856, Feb. 29; was educated at the Brooklyn Polytechnic Institute, Yale University, and in Europe; studied law in the Columbia Law School and praticed in New York city till 1890, when he was made U. S. consul to Barcelona, Spain. He was appointed consul-general at the same place in 1895, and became minister to Persia 1899, May, and to Venezuela 1901, June. In 1902, during the British and German embroglio with Venezuela, B. was appointed special commissioner to deal with the difficulty and acquitted himself successfully. In 1904–5 injudicious charges against his predecessor, F. B. Loomis, led to an investigation, and B. was dismissed from the govt. service, June, 1905. He is the author of *In Divers Tones; De Genere Humano; International Law,* etc.

BOWEN, James: military officer: 1808–1886, Sep. 29; b. New York. He inherited an ample fortune from his father, and was the first pres. of the Erie railway. He was also a member of the legislature 1848–9, and held other offices, state and municipal. On the outbreak of the civil war he organized a sufficient number of regiments

to form a brigade of vols., of which he was made brig.gen. 1862, Oct. 11. He resigned 1864, and was brevetted maj. gen. vols. 1865. He was provost-marshal gen. of the dept. of the Gulf, after Gen. Butler left New Orleans. B. served as commissioner of charities in the city of New York for a number of years. He was a man of literary attainments, and a congenial associate of the leading men of New York.

BOWEN, JOHN WESLEY EDWARD: American theologian: b. New Orleans 1855, Dec. 3. He graduated at Boston University in 1878, and in 1885 received the degree of PH.D., from the University of New Orleans. He held pastorates in Newark, N. J., Boston, Baltimore, and Washington, 1882–92. Since 1888 he has been professor of the history of theology in Gammon Theological Seminary, Atlanta, Ga. He is a recognized leader in all educational and social movements for the betterment of the colored race, and an example of its possibilities in scholarly attainment. Publications: *Sermons; Africa and the American Negro; Discussions in Philosophy and Theology; Struggle for Supremacy between the Church and State during the Middle Ages; The Catholic Spirit of Methodism; The Theology and Psychology of the Negro Plantation Melodies; The Psychological Process in the Revelation of Doctrine; The United Negro* (1902); *The Religious History of the Negro; The Educational History of the Negro*, etc.

BOWEN, THOMAS M.: senator: 1825, Oct. 26———
———; b. near the present site of Burlington, Iowa. He studied law and was admitted to practice in Wayne co. when he was 18 years of age, and was elected to the legislature 1856. Two years later he removed to Kansas, and 1861, June, entered the army with rank of capt., but soon afterward raised the 13th Kan. infantry, of which he continued in command during the war, rising to the rank of brevet brig.gen., and for the last two years commanding a brigade. In 1864 he was a delegate from Kan. to the national republican convention. He settled in Ark. at the close of the war, where he was for several years a justice of the state supreme court. In 1871, he held the appointment of gov. of Idaho. He afterward settled in Colorado, practiced law, was 4 years a dist. judge, and was elected to the United States senate 1883.

BOWER, *bow'ẽr*, ARCHIBALD: Scottish writer: b. near Dundee 1686, Jan. 17, d. London 1766, Sept. 13. He entered the order of Jesuits in 1706. At Macerata, in Italy, according to his own account, he was counselor or judge of the Inquisition. In 1726 he quitted the order of Jesuits and went to Perugia, whence he fled secretly to England and professed himself a convert to the Protestant faith. He was employed by the booksellers in conducting the *Historia Literaria*, a monthly review of books, and in writing a part of the *Universal History*, in 60 vols. 8vo. The money which he gained by these occupations he is believed to have given or lent to the

society of the Jesuits, and thus to have purchased his re-admission among them about the year 1744. In 1748 he published the first volume of a *History of the Popes*, which was continued to seven volumes and characterized by the utmost zeal against Roman Catholicism.

BOWER, n. [Icel. *bur*, a separate apartment: AS. *bur*, a chamber: W. *bwr*, an inclosure]: a private chamber or retreat; a boudoir; 'ladies' bower,' a private apartment in ancient castles and mansions, used by ladies both as a parlor and sleeping-chamber. In a *garden*, a place covered with trees bent and entwined; a shady retreat; a cottage covered with creeping plants. BOWER, v. *bow'ėr*, in *OE.*, to lodge. BOWERY, a. *bow'ėr-ĭ*, shady; containing bowers. BOW'ERED, a. *-erd*, supplied with bowers. BOWER-BIRD, an Australian bird like a starling, which constructs an extraordinary habitation. *Note.*—The Scotch *byre*, a cow-house, is another spelling and application of *bower*, which originally signified a place to lie in, a dwelling-place: compare F. *bouverie;* Sp. *boyéra*, an ox-stall, a cow-house.

BOWERBANKIA, *bow'ėr-băng-kĭ-a:* a molluscoid genus, class *Polyzoa* or *Bryozoa*, order *Infundibulata*, the structure of which has been very carefully studied in the common British species, *B. imbricata*, one of the most abundant zoophytes on the coasts both of England and Scotland. It grows on sea-weeds, corallines, stones, etc., between high and low water mark, or in no great depth of water, and forms branching tufts sometimes 1½ inch in height. The branches are smooth and transparent, tubular, filled apparently with a granular fluid, and crowded with irrgularly scattered clusters of delicate horny ovate or ovate-cylindrical cells, so transparent as to permit the most easy observation of the whole internal structure. The zoöides, now named *polypides*, all are connected with the tube of the branch, and so with the common life of the *polypidom*. Each, fully expanded, is about one-twelfth of an inch in length, and has 10 finely ciliated tentacula. When alarmed it contracts very rapidly, the tentacula being first drawn in, and then the body of the polypide pulled into a cell. The organization is much higher than in many zoophytes. The mouth does not lead at once into the stomach, but into a funnel-shaped tube, which contracts into a gullet or *esophagus*, and ends in a globular gizzard apparently provided with radiating muscular fibres, and intended for trituration of the food. The gizzard opens below into a bag, regarded as the true stomach, and is supplied with a fluid, regarded as bile, from minute follicles or sacs in its sides, which follicles are therefore regarded as representing the liver. From the upper part of the stomach, near the entrance from the gizzard, arises the intestine, a straight tube which passes up by the side of the gullet, and terminates in an orifice outside the circle of tentacula, the structure thus exhibiting a strong resemblance to that of the Ascidian Mollusca. When the zoöid is retracted

the gullet is bent upon itself, and the tentacula are inclosed in a tube or sheaf formed by the inverted integument. When the zoöid is vigorous and lively, the cilia of the tentacula are kept in active motion, apparently quite under control of the will of the animal, forming a kind of whirlpool to bring animalcules or organic particles into the mouth.

BOWER-BIRD: Australian bird of the bird-of-paradise (q.v.) family, remarkable for their habit of making bower-like erections, called *runs* by the colonists of New South Wales, and for adorning them with gay feathers, rags, bones, shells, and such other white or brightly-colored objects as they can pick up. These bowers are not nests, but are built by the males and used by them particularly in the breeding season as places for assembling and holding the series of antics or 'dances' by which they attract the attention of the females. The bowers do not seem to serve any other specific purpose. The bowers of the Satin B. (*Ptilonorhynchus holosericeus*) are built among the branches of some tree, and appear to be repaired and frequented from year to year. The base consists of an extensive and rather convex platform of sticks, firmly interwoven, on the centre of which the bower itself is built of more flexible twigs. It is chiefly at and near the entrance that the shells, feathers, etc., employed for decoration are placed. The bowers of the Spotted B. (*Chlamydera maculata*) are longer and more avenue-like than those of the Satin B.; they are placed upon the ground, and are outwardly built of twigs, and beautifully lined with tall grasses so disposed that their heads nearly meet. The decorative propensity appears in the highest degree in this species. Bones, shells, etc., are arranged in much the same way at both entrances. Small pebbles are often transported by the birds from considerable distances.

The Satin B. is particularly abundant in the mountainous districts of the w. of New South Wales, and is found in all the 'brushes' from the mountains to the coast. The adult male has the whole plumage of a deep, shining black. The colors of the female are grayish green and brown, curiously mingled.—The Spotted B. rather smaller than the Satin B., or about the size of a starling, has a general color of rich brown, beautifully marked with black and buff; a band of elongated feathers of light rose-pink crossing the back of the neck, and forming a broad, fan-like, occipital crest. It is exclusively an inhabitant of the interior of Australia.

BOWIE-KNIFE, n. *bō'ĭ-nīf* [said to be named after its inventor, *Col. James Bowie*, a daring character of the s.w. United States]: a long, sharp-pointed knife or short sword, used by hunters and pioneer settlers; and, being always at hand, too liable to be used in a quarrel. It was often carried concealed in a sheath. Of late years its use is infrequent except on the extreme frontiers of civilization.

BOWING TOWARD THE ALTAR: an ancient practice in the church, derived from a belief in the superior sanctity of the east. There are scriptural allusions to the east, from which notions of this kind may have been drawn. There was also an early legendary belief that Christ coming to judgment would appear in the east. For these, and other reasons, it became customary to place the altar, with the crucifix and other symbols, at the eastern extremity of the church, to which all bowed, and toward which, in prayers, all turned.

BOW ISLAND, *bō:* island of coral formation in the s. Pacific, the largest in the Low archipelago; about 30 m. long and 5 m. broad. It can be approached only through a small opening in the reef at the n. end. Within the lagoon, the anchorage is safe. The e. side is well wooded but the w. is low and barren. Pearl oysters and other shell fish abound in the lagoon. The island was discovered 1768 by Bougainville, who gave it the name of La Harpe, which Cooke, who visited it in the following year, changed to the name it now bears. It derives its name from its shape, which is bow-like, the outer edge only being of land, and encircling a great central lagoon.

BOWKER, *bow'kėr,* Richard Roger, American author: b. Salem, Mass., 1848. He has been prominent in politics as an independent and was the originator of the independent Republican movement of 1879. He has edited the *Publisher's Weekly;* the *Library Journal* and the *American Catalogue,* and has published *Work and Wealth; Economics for the People; Copyright: Its Law and Its Literature; Primer for Political Education; Electoral Reform; The Arts of Life; Of Business; Of Politics; Of Education; Of Religion; Civil Service Examination.* He is also editor of *The Economic Fact-Book; The Readers' Guide in Economic, Social, and Political Science* (with Iles); *The Library List; The Annual Literary Index; Great American Industries* series in *Harper's Magazine;* the campaign text book of the Democratic party for the election of 1896; etc.

BOWL, n. *bōl* [F. *boule,* a wooden ball, a drinking-vessel—from L. *bulla;* It. *bolla,* a bubble, a boss: Icel. *bolla,* a bubble; *bolli,* a teacup]: a circular hollow vessel; a basin; a fountain; a wooden ball or large marble used for play on a level plot of ground, or in the room of a house: V. to roll as a bowl; to play at bowls; in *cricket,* to fling the ball toward the batsman. Bowl'ing, imp.: N. the art or act of playing at bowls. Bowled, pp. *bōld.* Bowl'er, n. one who plays at bowls; one who bowls at cricket. Bowl'ing-green, n. or Bowl'ing-alley, n. a place for playing at bowls. To bowl out, in *cricket,* to knock down the wicket of an opponent by bowling, and so put him out of the game.

BOWLDER: see Boulder.

BOWLDER CLAY: see Boulder Clay.

BOW-LEGGED, a. *bō′lĕg-gĕd* or *bō′lĕgd:* having the legs bending outward; bandy-legged; due in the majority of instances to Rickets (q.v.); the reverse of knock-knee, which has its origin in the same disease. There is a deficiency of lime salts in the bone, and an excess of the gelatinous material, so that the bone is unable to bear the weight of the body without giving way.

BOWLER, *bō′lẽr*, METCALF: revolutionary patriot: b. about 1730. Nothing is known of his early history, and his name is remembered only in connection with an important British act 1774. A royal decree had been issued transferring the seat of govt. of the Mass. colony from Boston to Salem, and closing the former place as a port of entry: this was a penalty for the patriotic sentiment shown in Boston. B. was at this time speaker of the R. I. assembly, and went to Boston to proclaim the union of the 13 colonies in opposition to the decree—the first official act of resistance to the royal authority on the part of the colonies.

BOWLES, *bōlz*, FRANCIS TIFFANY: naval architect: 1858, Oct. 7————————; b. Springfield, Mass.; nephew of Samuel B. (q.v.). He was distinguished for scholarship at the U. S. Naval Acad., Annapolis; and after his graduation was selected to attend the Brit. school of naval architecture at Greenwich, England. He was appointed asst. naval constructor in the U. S. navy 1881; sec. to the naval advisory board at Washington 1882–86; then put in charge of construction and repairs at the navy-yard Norfolk, Va.; promoted naval constructor 1888. In 1901 he was commissioned chief constructor of the navy, with the rank of rear-admiral.

BOWLES, SAMUEL: journalist: 1826, Feb. 9—1878, Jan. 16; b. Springfield Mass.; son of Samuel B., founder of the Springfield weekly *Republican*. He was educated at a private school in Springfield, but, at the age of 17, was working in his father's printing office, and a year later induced his father to start the *Daily Republican* 1844, Mar. 27, the first attempt of this character in Mass., outside of Boston. The *Republican* began as an evening paper, but within two years was changed to a morning issue, and was then a financial succees, and by 1850 had the largest circulation of any daily newspaper in New England, Boston excepted. B.'s health gave way 1845, and he passed a winter in the South, at the same time contributing a series of letters to his paper, which attracted wide attention. He associated with him in the editorial dept., Dr. J. G. Holland (afterward editor of *Scribner's Magazine*), who continued one of the editors of the *Republican* till 1857, and contributed to it till 1860. Samuel B., Sr., died 1851, and the entire business management of the paper came into the hands of his son. In 1857, for a few months, he was editor of the Boston *Traveller;* but that year he bought Dr. Holland's interest in the *Republican*, and took full control. In his editorial work he showed amazing industry and unflinching fearlessness. Originally a whig, B.

became one of the founders of the new republican party, and supported Fremont for the presidency 1856, at the same time advocating universal suffrage, without regard to color or sex. He also headed, 1855, an organized movement in Boston designed to break down the recent know-nothing (or anti-foreign) supremacy in Mass. During the civil war, the *Republican* was a powerful advocate of the Union; and it continued to sustain the republican party until 1872, when it supported Horace Greeley for the presidency. From that time forward it assumed an independent position in politics, meanwhile acquiring national reputation for literary ability, intellectual vigor, and journalistic enterprise. B., though personally charming and friendly, kept his friendship distinct from his editorship. He visited Europe 1862, 70, 71, and 74. He wrote several books, including *Across the Continent; The Switzerland of America;* and *Our New West.* He was master of a lucid, vivid, and impressive style as a writer; and was remarkably agreeable in conversation. See *Life and Times of Samuel Bowles,* by George S. Merriam (1885).—His son, SAMUEL B., third (b. Springfield, Mass., 1851, Oct. 15), assumed the proprietorship of the *Republican* on his father's death.

BOWLES, WILLIAM AUGUSTUS: adventurer: 1763—1805, Dec. 23; b. in Frederick co., Md. At the age of 13 he entered the Brit. army, then occupying Philadelphia; was commissioned; dismissed; joined the Creek Indians, and married an Indian squaw. He instigated the Creeks in many outrages on the colonists. After the war he was a continual mischief-maker among the Indians. He greatly annoyed the Georgia settlers; and preyed upon the Spaniards so that they offered $6,000 reward for his capture. In 1804 he was betrayed to them; and died a prisoner in Moro Castle, Havana.

BOWLES, WILLIAM LISLE, D.D.: 1762, Sep. 24—1850, Apr. 7; b. King's Sutton, Northamptonshire, where his father was then vicar: English poet. He received his education at Winchester School, and at Trinity College, Oxford, and became at last a prebendary of Salisbury Cathedral, 1803, and rector of Bremhill, Wiltshire, 1805. Here he spent, in comparative affluence, the remainder of his life of nearly 88 years, which ended at Salisbury. His poetical career began with the publication, 1789, of *Fourteen Sonnets, written chiefly on Picturesque Spots during a Journey.* This unpretending little volume was received with extraordinary favor; the sonnets were fresh and natural, and to many minds, all the more charming because of the contrast which they presented to the style of poetry which had long been prevalent. Coleridge, Wordsworth, and Southey were among their enthusiastic admirers; and, through the influence which he exercised over them, B. may be regarded as the founder of a school of English poetry. in which their names soon became

greater than his own. The subsequent poetical works of B. are very numerous, of which *The Spirit of Discovery* and *The Missionary* are generally regarded as the best of his longer blank verse poems. As a poet, B. shows fine appreciation of the beauties of nature, and pleases by the expression of pure and generous sentiment, as well as by playfulness of fancy and perfect scholarly correctness, but he is greatly deficient in vigor and depth. He published an edition of Pope's works 1807; and an opinion which he expressed on the poetical merits of Pope, led at a subsequent period to a rather memorable controversy, in which Campbell and Bryon were his antagonists, and which turned chiefly upon the comparative value in poetry of images derived from nature and those derived from art. B. was generally admitted to have discomfited his opponents. He frequently employed his pen in defense of the Church of England, and endeavored to vindicate all the peculiarities of the older English educational institutions. Of his prose writings may be mentioned a volume of sermons (Lond, 1826), and a rather dry *Life of Thomas Ken, deprived Bishop of Bath and Wells* (2 vols., Lond. 1830–1).

BOWLING GREEN, *bō'ling grēn:* town, the seat of justice of Warren co., Ky., at the head of steamboat navigation of the Barren river, about 20 m. s.e. of Woodbury, 120 m. s.w. of Frankfort, 71 m. n. by e. of Nashville; on the Louisville and Great Southern railroad—one branch of which connects it with Nashville and the other with Memphis. It is prominent as an educational centre, being the seat of Ogden College, Potter College for women, the Southern Normal School, Saint Columbia's Academy, and a business college. Pop. (1870) 4,574; (1880) 5,114; (1890) 7,790; (1900) 8,226; (1910) 9,173.

BOWLS, BOWLING, an American indoor game, also much played in Great Britain. It is played in a covered alley from 65 to 70 feet in length and about 3 ft. 6 in. wide. The alley has a gutter on each side and is slightly convex in the centre. At the farther extremity ten pins, generally of ashwood, and shaped somewhat like a champagne bottle with a slightly tapering base, are set up in the form of a triangle with the apex toward the bowler, with four pins on the rear or fourth line, three on the third, two on the second, and one on the first, all 12 in. apart. The balls may never exceed 27 in. in circumference but smaller sizes are optional. The bowler is entitled to two (formerly three) balls, which he rolls at the pins, the object being to knock down as many pins as possible, the number displaced being registered to the bowler's credit. In 1895 the American Bowling Congress was formed, which has published full rules for the game.

Another form of bowls is very popular in England. It is played upon a smooth, flat piece of turf, from 40 to 60 ft. square, surrounded by a trench or ditch about half a foot deep. The players arrange themselves in sides,

usually of four each, and each man is usually provided with two bowls. The bowls are made of lignum-vitæ wood, of 6 or 8 inches in diameter, nearly round and with a bias to one side. A smaller ball, perfectly spherical, and white, is placed at one end of the bowling-green; this is termed the *jack;* and the aim of the players, who stand at the other end of the green, is to send their B. that they may lie as near as possible to the jack. The side whose B. are nearest the jack reckon one point for each bowl so placed. 7, 14, 21, or 31 make game, according to mutual arrangement beforehand. B. are biased or weighed on one side, that the player may reach the jack by a curved instead of a straight course, an expedient which the nature of the game renders particularly desirable. Indeed, were it not for this, the game would lack half its charms.

If a bowl goes into the ditch without touching the jack, it cannot count in the scoring of that end; but if it strikes the jack, and then rolls into the ditch, it reckons as if on the green. When the jack is carried by a bowl into the ditch, it is usually lifted, and placed on the green as near as possible to its position in the ditch. See CRICKET.

BOWMAN, *bō'man*, EDWARD MORRIS, American organist: b. Barnard, Vt., 1848, July 18. He studied in New York under Dr. William Mason, in London under Dr. Bridge, in Berlin under Weitzmann and Bendel, and in Paris under Guilmant. In 1895 he took charge of the Temple Choir in connection with the Baptist Temple, Brooklyn, N. Y., and succeeded in making popular a high standard of music, both ecclesiastical and secular. In 1891 he succeeded Dr. F. Ritter as professor of music at Vassar College. He was a founder and for eight terms president of the American College of Musicians. His compositions comprise songs, part songs, anthems, and orchestral numbers, and he has published: *Bowman-Weitzmann Manual of Musical Theory* (1877); *Harmony: Historic Points and Modern Methods; Formation of Piano Touch; Relation of Musicians to the Public.*

BOWMAN, THOMAS, D.D.: bishop of the Meth. Episc. Church: 1817, July 15————; b. near Berwick, Columbia co., Penn. He graduated at Dickinson Coll., Carlisle, Penn., 1837; was licensed to preach in the Meth. Episc. denomination 1838, and had a traveling connection 1839. He taught in the grammar school of Dickinson Coll. 1840–48. From 1848–58 he was principal of Dickinson Seminary, Williamsport, Penn. He was pres. of Indiana Asbury (now De Pauw) Univ., Greencastle, Ind., 1858–72; and was made bp. 1872. He was chaplain of the U. S. senate 1864–5, and was made chancellor of De Pauw Univ. 1884.

BOWMAN, Sir WILLIAM PAGET, M.D., LL.D., Bart., 1816, July 20—1892, Mar. 28; b. Nantwich, England. He received a medical education at King's Coll., London, and entered into general practice in that city, but gradually became a specialist in diseases of the eye, and achieved

high reputation in this department. He was first pres. of the Ophthalmological Soc. of the United Kingdom, and received the royal medal in physiology from the Royal Soc. 1842. He was hon. sec. of the Royal Institution of Great Britain for 3 years, and corr. mem. of many European scientific bodies. He published several important works in his specialty: *Lectures on the Parts concerned in the Operations of the Eye; Observations on Artificial Pupil; Physiological Anatomy and Physiology of Man;* etc.

BOWNE, *bown*, Borden Parker, ll.d.: educator: b. Leonardville, N. J., 1847, Jan. 14. After graduating at the Univ. of New York, 1870 he went to Germany, and studied at Halle and Göttingen. In 1876 he was appointed prof. of philosophy in the Boston Univ., and has continued to occupy that chair. B. has become eminent in his dept., making frequent contributions to the literature of philosophy, particularly in regard to the relation of ethics to religion. His writings include *The Philosophy of Herbert Spencer* (1874); *Studies in Theism* (1879); *Metaphysics* (1882); and *Introduction to Psychological Theory* (1886); *Philosophy of Theism* (1887); *The Principles of Ethics* (1892).

BOWRING, *bow'rĭng*, Sir John: 1792, Oct. 17—1872; b. Exeter: English politician, linguist, and author. He early applied himself to the study of languages, in the acquisition of which he showed unusual talent. The national poetry of different peoples had particular attractions for him, and he rendered great service to literature by collecting and translating the ancient and modern popular poems of almost all the countries of Europe. His translations preserve remarkably well both the meaning and the spirit of the original and evince good powers of versification. B. was intimately associated with Jeremy Bentham, who appointed him one of his executors and intrusted him with the editing of his collected works. Of Puritan descent he early came forward in writing and speaking against the political disadvantages experienced by dissenters. He took part from the first in the *Westminster Review*, established 1824, and edited it for about five years from 1825. In 1828 he visited Holland and his letters—in the *Morning Herald*, and shortly afterward translated into Dutch—procured for him the degree of Doctor of Laws from the Univ. of Groningen. Subsequent travels were undertaken by him, on a commission from the British government, to inquire into the commercial relations of certain states. He visited Switzerland, Italy Egypt, Syria, and finally the countries of the German Zollverein, and everywhere found materials for valuable reports. He was a member of the house of commons, 1835–37 and 1841–49, and actively prompted the adoption of free trade. In 1849 B. was appointed British consul at Hong Kong, and superintendent of trade in China. He returned, 1853, and in the following year was made knight and gov. of Hong-Kong. In 1856, an insult having been offered to a Chinese vessel, said to have been under

the protection of the British flag, B., without consulting the home government, ordered an attack on certain Chinese ports, a proceeding which excited considerable dissatisfaction in the country and produced a ministerial crisis. B. afterward returned to England. In 1855 he concluded a commercial treaty with Siam and gave an interesting account of his visit in a work entitled *The Kingdom and People of Siam*. He retired on a pension, 1859, and 1861 was sent on an official mission to Italy. His *Autobiographical Reminiscences* were pub. 1871.

BOWS, n. plu. *bowz:* see under Bow 2.

BOWSE, v. *bowz*, among *seamen*, to pull or haul hard. Bows'ING, imp. BOWSED, pp. *bowzd*. BOWSE AWAY, to pull together.

BOWSE, v.: to carouse: see BOOSE.

BOWSPRIT: large boom or spar projecting forward from a vessel under the bow.

BOW'STRING HEMP: English name, for the fibre produced by *Sansevie'ra Zeylanica*, a plant of the nat. ord. *Liliaceæ* (q.v.), tribe *Hemerocalleæ*, native of the East Indies. The employment of the fibre for making bowstrings led to this name. The genus *Sanseviera* is distinguished by a colored, funnel-shaped perianth, with a long tube, into the throat of which the stamens are inserted, and a three-celled and three-seeded, or abortively one-celled and one-seeded, berry. The plants have a general appearance much like that of many species of *Iris*, but their leaves are more fleshy; they have a thick creeping rhizome or root-stock; the radical leaves are long and narrow, and the flowering stems have only scale-like leaves.—Very similar to *S. Zeylanica* are *S. Roxburghiana* and *S. lanuginosa*, also natives of India. These plants grow under bushes in jungles near the sea, where the soil is salt, but may easily be propagated on almost any soil by the shoots which issue in great abundance from the root-stock. They are perennial. The leaves are about two ft., or in cultivation three or four ft., long; the fibres extend their whole length; and to separate the fibres from the pulpy part of the leaves, the natives place them on a smooth board, then press one end of the leaf down with one of their great toes, and with a thin bit of hard stick, held between the two hands, they scrape the leaf from them, and very quickly remove every part of the pulp. Steeping in water is also practiced, but it discolors the fibre, which is beautifully white. The fibre is hair-like and silky, elastic, and in strength apparently about equal to hemp. It does not rot in water so soon as hemp. A species of *Sanseviera* very similar to the Indian ones, *S. Guineensis*, is found in abundance along a great extent of the w. coast of Africa.

BOW-WOW, int. *bow'wow*, one of the cries of a dog: N. a familiar name applied by Max Müller to designate the theory which derives language from the direct imitation of natural sounds.

BOWYER, *bō′yėr* [from *bow,* as *lawyer,* from *law*]: in *OE.,* one who uses the bow; an archer; a maker of *bows.*

BOWYER, *bō′yėr,* WILLIAM: 1699–1777; b. London: English printer and classical scholar. He was educated at Cambridge, and in 1722, joined his father in trade. Appointed, 1729, printer of the votes of the house of commons, he subsequently became printer to the Soc. of Antiquaries and to the Royal Soc. In 1767, he was nominated printer of the Rolls of the house of lords and the Journals of the house of commons. B. published several philological tracts, but his chief production was an edition of the New Testament in Greek, with critical and emendatory notes. He left a considerable sum in trust to the Stationers' Company for relief of decayed printers. See *Literary Anecdotes of the Eighteenth Century* (9 vols., 8vo).

BOX, n. *bŏks* [AS. *box;* Gr. *puxis;* Ger. *büchse,* a box: Gr. *puxos;* L. *buxus,* a box-tree—*lit.,* an article or hollow vessel made of boxwood]: a case or hollow vessel of any size and shape, and made of any material; a seat separated from others; a shrub having a fine close-grained wood—the *Buxus sem′pervir′ens,* ord. *Euphorbiāceæ:* V. to inclose. BOXEN, a. *bŏk′sn,* made of boxwood; resembling boxwood in color. BOXING THE COMPASS, rehearsing the points, half-points, and quarter-points of the mariner's compass in their order; one of the lessons which a young sailor has to learn. IN THE WRONG BOX, mistaken; out of one's proper place. IN A BOX, in an embarrassing position; in a difficulty. BOX OF A COACH, the driver's seat on a carriage. BOX-DAYS, in the Scotch court of session, two days in the spring and autumn vacations respectively, and one day in the Christmas recess, during which, according to an order of the court of session, 1690, Nov. 29, pleadings may be filed—that is, placed in a *box* through a slit: see BILL-CHAMBER: COURT OF SESSIONS: and other COURTS. BOXING-DAY, the day after Christmas-day, or box-day, on which Christmas-boxes are given to servants and others: see CHRISTMAS-BOX. BOX-HAULING, a particular mode of turning a ship, when the swell of the sea renders tacking impossible, or when the ship is too near the shore to allow room for veering. The operation is effected by a peculiar management of the helm and the sails. *Boxing-off* is an operation very similar to box-hauling: see TACK: VEER. BOX-IRON, a hollow smoothing-iron, heated by a hot iron within. BOX-KEEPER, one who has charge of the inclosed seats or boxes at a theatre. CHRISTMAS-BOX, a present at Christmas, generally in money.

BOX, v. *bŏks* [Dan. *bask,* a sounding blow; *baske,* to slap: Gael. *bosag,* a slap, as on the cheek—from *bos,* the palm of the hand; *boc,* a blow]: to fight with the hands or with clenched fists; to strike: N. a blow with the hands or with clenched fists. BOX′ING, imp.: N. the act of fighting with the fists. BOXED, pp. *bŏkst.* BOX′ER, n. one who fights with his fists. BOXING-GLOVE, padded gloves used in learning the art of boxing and in sparring. BOXING-MATCH,

a fight with fists or with boxing-gloves; a pugilistic encounter. See PUGILISM.

BOX (*Buxus*): genus of plants, nat. ord. *Euphorbiaceæ;* evergreen shrubs or small trees, with opposite leaves, entire at the margins and easily split into two plates. The greenish inconspicuous flowers grow in little axillary clusters, the male and female flowers distinct but on the same plant. The male flowers consist of a perianth of four leaves and of four stamens; the female flowers have a perianth of three or four leaves, and in addition three small bracts at the base, an ovary surmounted by three styles and two honey-secreting glands. The capsule has three beaks and three cells, and two or three black seeds in each cell.—The most important species is the COMMON Box (*B. sempervirens*), which grows wild in the s. of Europe and in some parts of Asia It is generally re-

Common Box.
b, *a*, female flower.

garded as a true native of the s. of England, where it grows on dry, chalky hills, and is remarkable as the only arborescent species of *Euphorbiaceæ* found in such cold latitudes. In Britain it seldom attains a height of more than 12 or 14 ft., but in warmer countries it is often twice that height. Its leaves are oval, generally from half an inch to three-quarters of an inch in length, smooth and shining, of a deep green color. The box is remarkable for its compact habit of growth and densely crowded branches and leaves, presenting a very solid mass of foliage. There are several cultivated varieties, distinguished by differently variegated leaves—gold-edged, silver-edged, etc. The most interesting variety, however, is a very humble one, called DWARF BOX, which grows only to a height of two or three ft. and of old commonly used in the United States and in Europe to form edgings for garden-plots, being kept down by clipping to the height of a

few inches. These edgings are formed usually by planting cuttings, which readily strike root. The box bears clipping remarkably well; and in a style of gardening once fashionable, but condemned by the taste of the present day, it occupied an important place, being cut into architectural and fantastic figures. The leaves of the box have a smell which is disagreeable to some people, and a very disagreeable bitter taste. When taken inwardly they cause purging; an external application of them promotes the growth of the hair. In France they are sometimes used instead of hops in making beer, but are extremely improper for the purpose. The wood of the box is heavier than that of any other European tree, and is the only European wood that sinks in water. It is of a beautiful pale-yellow color, remarkably hard and strong, of a fine regular and compact texture, capable of a beautiful polish, and not liable to be worm-eaten. It is much valued for the purposes of the turner and the wood-carver; is preferred to every other kind of wood for the manufacture of flutes, flageolets, and other wind-instruments, as well as of mathematical instruments, and is unrivalled for wood-engraving, admitting of a finish as sharp and fine as metal, while it *takes* the *ink* much better. See ENGRAVING. When scraped down and boiled it can be used as a sudorific in many complaints, and as a substitute for guiacum. An empyreumatic oil, obtained from box-wood chips, is used for relief of toothache and for other medicinal purposes. Spain and Portugal send into the market large quantities of box-wood; also Circassia and Georgia, from which countries it finds its way to Odessa, and is again exported thence. The MINORCA BOX, or BALEARIC BOX (*B. Balearica*), a native of Minorca, Sardinia, Corsica, Turkey, etc., is a larger tree than the common box and has leaves three times as large. It is much less patient of frost, but is occasionally seen in shrubberies in the s. of England. The wood is of a bright yellow and inferior to the true box-wood, but is brought in large quantities from Constantinople under that name, for wood-engraving.

BOX-ELDER, or ASH-LEAVED MAPLE: the *Negúndo aceroides*, a handsome, rather small tree, common along streams from Pennsylvania s. and west. In some parts of the northwest, sugar is manufactured from it. A variety having white variegated leaves is cultivated for ornament. The native green tree is much used for shade at the west. It has rich green foliage, light green twigs, compact form, and a toughness that resists violent winds; the fruit forms drooping clusters of large winged seed. Its name elder is unfortunate, as it is a maple, and does not belong to the family in which the elder (*Sambucus*) is placed.

BOXERS, *bŏk'sėrz:* members of a Chinese secret society which aims ostensibly at the expulsion of foreigners from China. The origin of the Boxers appears to have been due to fanatic opposition to Christian missionaries and to the encroachments of European powers upon Chinese territory.

Early in 1900 the native population in Shantung were found to be rallying around the standard of the Boxers and adopting its motto, 'Uphold the dynasty, drive out the foreigners.' The diplomatic corps at Peking called upon the imperial government to suppress the movement. This the court professed its readiness to do, although there was a suspicion voiced by the British minister that the Empress Dowager had fallen under the influence of a native party led by Tung Fu-hsiang and Yu-hsien, and was temporizing with the Boxers. In 1900, May, the Boxers began a concerted movement upon the Chinese capital which, notwithstanding the protests of the diplomatic corps, remained unchecked by the military forces of the empire. In 1900, June, Peking was reduced to a state of siege by the Boxers. The position of the foreigners in the capital became precarious. The entire diplomatic corps was cut off from communication with the outside world. In the emergency the powers hurried military and naval forces to the scene, and an international relief column, under the command of Admiral Seymour of the British navy, moved upon Peking. This force was, however, compelled to retreat, when a short distance beyond Tien-Tsin, with a loss of 300 men. The position of the capital now became desperate. Cut off from communication with the rest of the world, Peking was a scene of turbulence and the centre of wild rumor. It was reported that on July 7 the entire diplomatic corps had fallen a prey to Boxer fury. The movement had spread in all directions among the Chinese, who, on July 16, invaded Siberia. Russia at once proclaimed a state of siege in its Asiatic dominions. The powers did not, as yet, give formal recognition to a state of war, chiefly in consequence of the attitude of the U. S., which took the ground that the Chinese government had been overpowered by an insurrectionary movement. On July 20 the powers made a categorical demand to be placed in communication with their diplomatic representatives. The authorities at Peking professed their readiness to comply at the earliest possible moment. See CHINA.

BOYACA, *bō-yâ-kâ′:* town of the U. S. of Colombia, near which, 1819, Bolivar, by a victory over the Spaniards, secured the independence of Colombia. It gives name to the dept., which stretches from the plateau of Bogota to the borders of Venezuela, being watered by the Magdalena, Sogamozo, Zulia, Cazanare, and Meta rivers. The capital, however, is not B. itself, but the neighboring city of Tunja about 70 m. n.n.e. of Bogota.

BOYAR, n. *boy′âr,* a Russian nobleman: see BOIAR.

BOYAU, n. *boy′ō,* BOYAUX, n. plu. *boy′ōz* [F. *boyau,* a bowel, a long and narrow place]: in *fort.,* a ditch covered with a parapet, serving as a communication between two trenches; zigzag trenches to enable besiegers to approach a town.

BOY-BISHOP: a boy elected on St. Nicholas's Day, in

a strange semi-farcical, semi-solemn imitation of the ecclesiastical prelate, according to a custom dating from a very early period. It quickly spread over most Rom. Cath. countries, and in England seems to have prevailed in almost every parish. Although the election took place on St. Nicholas's Day (Dec. 6), the authority lasted to Holy Innocents' Day (Dec. 28). The B. was chosen from the children of the church or cathedral choir, or from the pupils at the grammar-school. He was arrayed in episcopal vestments, and, attended by a crowd of subordinates in priestly dress, went about with songs and dances from house to house, and went through the forms of blessing and preaching. The B. exacted implicit obedience from his fellows, who, with their superior, took possession of the church, and performed all the ceremonies and offices except mass. If the B. died during his office, the funeral honors of a bishop, with a monument, were granted him. In England, the custom of electing a B. was abolished by a proclamation of Henry VIII., 1542, July 22; restored by Queen Mary 1554; and again abolished during the reign of Elizabeth.

BOYCE, *boys*, WILLIAM, Mus. Doc.: 1710–79; b. London: English composer. He was instructed by Dr. Greene, and became organist to the Chapel Royal 1758. His best productions are: a *Te Deum*, six anthems; *Collection of Cathedral Music; The Cathedral Music of the English Masters of the Last Two Centuries* (1760, 3 vols. folio); *Solomon;* and the grand anthem, *Lord, Thou hast been Our Refuge.*

BOYCE, JAMES PETIGRU, S.T.D., LL.D.: Baptist minister: 1827, Jan. 11—1888, Dec. 28; b. Greenville. S. C. Having graduated at Brown Univ. 1847, and Princeton Seminary 1851, he was ordained pastor of a Bapt. chh. in Columbia, S. C. He was prof. of theol. in Furman Univ., Greenville, 1855–58; and then in the Southern Bapt. Theol. sem. in Greenville, which received large endowments from Baptists in Ky., to which was added a liberal donation from Prof. B., and 1873 the institution was removed to Louisville, Ky. B. then was chosen its pres. and held that office till his death in Pau, France.

BOYCOTTING: English word familiarly expressing exclusion from social or business intercourse. It signifies also intimidation by threatening to exclude from such intercourse. B. has been practiced frequently in Ireland and in the United States; as in Milwaukee when the brewers withheld their business patronage from the merchants who favored the observance of the Sunday laws; and during the labor troubles in this country, 1886, 7, and 1888, Feb., in the mining region of Pennsylvania. When the method is by conspiracy, libel, or blackmail, with the intent and actual effect of injuring others in business or reputation, the offense is punishable in the law courts. It has been held by the U. S. circuit court that boycotting Chinamen is a violation of the constitution of the United States, and of our treaties with China. See CONSPIRACY: TRADE UNION.

The word is from *Boycott*, the name o. an agent in Ireland of Lord Erne's Lough Mask estate. He made himself extremely unpopular with his tenants by burdensome fines, and by evicting many for non-payment of rent. Advised by the Land League, the tenants and their neighbors resolved that they would have no intercourse with him or his family, and would not work for him or trade with him, or allow others to do so. Abandoned by his farm-servants, shepherds, post-boy, laundresses, smiths, grocers, and tradesmen, and with his crops rotting in the ground, his only hope was aid from a distance. The Orangemen of Ulster responded, and, protected by a thousand soldiers, gathered his farm produce. He and his family were then conveyed in a guarded ambulance to Claramorris, whence, on the following day, they went to London.

BOYD, Andrew Kennedy Hutchison, s.t.d. ll.d.: Presbyterian minister and author: 1825, Nov.—1899, Nov. 2; b. Auchinleck, Scotland. He was educated at King's Coll., London, and at Glasgow Univ., where he graduated with the highest honors in philosophy and theology 1846. Ordained minister of the Chh. of Scotland 1851, he was incumbent successively of the parishes of Newton-on-Ayr, Kirkpatrick-Irongray, St. Bernard's (Edinburgh), and of the Univ. city of St. Andrew's. He wrote three series of *The Recreations of a Country Parson.* Several vols. of his sermons have been pub. under the titles, *Graver Thoughts of a Country Parson; Counsel and Comfort Spoken from a City Pulpit;* etc.; also his reminiscences, *Twenty-five Years of St. Andrews* (2 vols. 1892); *Present-Day Thoughts* and *Memorials of St. Andrew's Sundays; Toward the Sunset; What Set Him Right; The Best Last; St. Andrew's and Elsewhere;* etc. B. was elected moderator of the Scottish Chh. gen. assembly 1890.

BOYD, Ellen Wright, American educator: b. Winsted, Conn., 1833, Sept. 8. She was for 25 years principal of Saint Agnes' School, at Albany, N. Y., and has published *Outlines of Religious Instruction; English Cathedrals; Famous Art Galleries.*

BOYD, James P., American lawyer and author: b. Lancaster County, Pa., 1836, Dec. 20. He was admitted to the bar in 1863 and successively edited several Philadelphia newspapers. His published works comprise: *Lalecca* (1872); *Envious Merchant* (1874); *Building and Ruling the Republic* (1884); *History of the Crusades* (1890); *Bible Dictionary* (1896); *Paris Exposition* (1900); and *Lives* of Grant, Sherman, Sheridan, Blaine, Harrison, McKinley, Emperor William I.; *Men and Issues* (1892–1900). He has also edited *Triumphs and Wonders of the Nineteenth Century* (1900); *Medicology* (1901); *Manual of the Nation* (1903); and was associate editor of the *World's Drama, and Analytical Reference History* (1904).

BOYD, John Alexander, Canadian jurist: b. Toronto, 1837, April 23. He was educated at Upper Canada Col-

lege and Toronto University; was called to the bar 1863; became master in chancery; Queen's Counsel 1880; Chancellor 1881; president of the High Court of the Province of Ontario (1887); arbitrator for Dominion government 1888–9; arbitrator for Ontario (1893). He is also a governor of M'Master University and has written a *Summary of Canadian History.*

BOYD, John Parker, American soldier: b. Newburyport, Mass., 1764, Dec. 21; d. Boston, 1830, Oct. 4. He entered the army in 1786 as ensign in the 2d regiment, but peace service did not suit his adventurous spirit and in 1789 he went to India. Under Nizam Ali Khan he was given an important command in Madras and at one time had an army of 10,000 men at his disposal. Returning home in 1808 he was appointed colonel of the 4th regiment, United States Army. He took part in the battle of Tippecanoe, November 1811; was made brigadier-general August 26 and held that rank throughout the War of 1812. He was at the capture of Fort George, and in the battle of Chrysler's Field, Canada. In 1816 he went to England to secure indemnity for the loss of a valuable cargo of saltpetre captured by an English cruiser, but procured only a single installment of $30,000. President Jackson appointed him naval officer at Boston in 1830.

BOYD, Mary Stuart, Scottish writer. She was married to Alexander S. Boyd, a well-known illustrator, in 1880, and since 1890 has resided in London. Beside numerous contributions to reviews and other periodicals she has published *Our Stolen Summer* (1900); *A Versailles Christmastide* (1901); *With Clipped Wings* (1902); *The Man in the Wood* (1904).

BOYD, Thomas Duckett, American educator: b. Wytheville, Va., 1854, Jan. 20. He graduated at Louisiana State University, and has held important posts in the educational institutions of Louisiana. Since 1896 he has been president of Louisiana State University.

BOYD, Zachary: eminent Scottish divine; born before 1590; d. 1653 or '4: educated at Kilmarnock, and at the universities of Glasgow, and Saumur in France, of which latter he was, 1611, appointed a regent or prof., and is said to have declined the principalship. The persecutions of the Protestants in France caused him to return to Scotland 1621. In 1623, he became minister of the Barony parish, Glasgow, and was thrice elected rector of the univ. of that place. His principal prose work, *The Last Battell of the Soule in Death*, published in Edinburgh, 1629, in two vols., was reprinted, with a life of the author, by Gabriel Neil, Glasgow, 1831. He was author of 18 other works, chiefly religious. The third edition of his *Psalmes of David in Meeter* appeared at Glasgow, 1646. At his death he left numerous MSS. and his library, with a considerable legacy, to the College of Glasgow, over the court gateway of which is his stone bust, while his portrait is in the Divinity Hall of the same univ. Among his MSS. is a collec-

tion of quaint poems on Scriptural subjects, entitled *Zion's Flowers* usually called Zachary Boyd's Bible; its style is amusingly homely.

BOY'DELL, John: 1719–1804, Dec.: liberal patron of art in England. At the age of 21 he apprenticed himself for seven years to an engraver in London, and on the expiration of his apprenticeship, published, by subscription, a series of views in England and Wales, with the profits of which he set up a print-selling business in the metropolis. English engraving was at a low ebb; but under B.'s liberal patronage of native artists, the importation of prints nearly ceased, and English prints were exported to the continent. B., seeking to do for English painting what he had done for engraving, selected Shakespeare's works for illustration; and secured the most eminent painters in the kingdom, including Opie, Reynolds, Northcote, and West: the result was the magnificent 'Shakespeare Gallery,' from which was engraved a superb volume of plates (Lond. Boydell, 1803). B. published also a splendid edition of Shakespeare's works, 9 vols. fol. (1792–1801). The immense cost of the Shakespeare illustrations and the commercial depression consequent on the French Revolution, brought him into some financial difficulties in his last years.

BOY'DEN, Seth: 1788–1870; b. Foxborough, Mass.: inventor. He spent his boyhood in working on the farm and at study in the common school. His leisure time was spent in the blacksmith's shop; and, at the age of 21, he had constructed, after his own invention, machines for cutting files and making nails. He also invented improvements on leather-splitting machines, substituted the straight axle for the crank in locomotives, and introduced a cut-off connected with the governor in place of the throttle valve. Others reaped the profits of his inventions, and he, like many other benefactors, remained poor to the end.

BOYDEN, Uriah Atherton: inventor: 1804, Feb. 17—1879, Oct. 17; b. Foxborough, Mass.; bro. of Seth. B. In early life he learned the blacksmith's trade; later was a civil engineer constructing railroads; then turned to hydraulic engineering and made important improvements in turbine water-wheels. From 1850 he applied himself to the study of chemistry and physics in Boston. He established a solders' memorial building in Foxborough, and gave $1,000 to the Boyden Library there, and placed with the Franklin Institute (Philadelphia) $1,000 to be awarded to the resident of N. America who should experimentally determine whether all forms of radiant energy are transmitted with the same velocity.

BOYÈ, bwâ yā′, Martin Hans, Danish-American chemist and genealogist: b. Copenhagen, Denmark, 1812, Dec. 6. He was a graduate from the University of Copenhagen in 1832 and from the medical department of the University of Pennsylvania in 1844. He came to the United States

in 1836, was assistant to Dr. Robert Hare, in chemical investigations 1837–8, and assistant geologist and chemist of the first geological survey of Pennsylvania 1838–43. He and others jointly discovered a new chemical compound, chloride of platinum with binoxide of nitrogen (1839); jointly discovered perchloric ether, the most explosive of all substances (1841); conducted a laboratory for analysis and instruction in analytical and practical chemistry (1842–5); and in the latter year discovered and with others applied the first process of refining cotton-seed oil, specimens of which were exhibited at the Centennial Exposition at Philadelphia 1876, receiving first premium. He was professor of chemistry at the Central High School in Philadelphia, 1845–59, retiring in the year last named. He has published: *Pneumatics, or the Physics of Gases* (1856); *Chemistry, or the Physics of Atoms* (1857). He wrote also *Explosive Power Perchloric Ether* in the *Proceedings* of the American Philosophical Society, Vol. II.; *Perchloric Ether* in *Transactions* of the same society, Vol. VIII.; article *Analysis* in Booth's *Chemical Encyclopedia;* and *Analysis of the Bittern of a Saline on the Kiskeminetas; of Magnetic Iron Pyrites Containing Nickel; of Schuylkill, Croton and Rock Creek Waters*, etc. in Silliman's and Franklin Institute *Journals* (1842–5).

BOYER, *bwâ-yā'*, Alexis, Baron de: 1757, Mar. 30 (or 1760)—1833, Nov. 25; b. Uzerche, Limousin: French surgeon of the greatest eminence. He was for some years in the service of a notary before he began his medical studies. In 1787, he was appointed second surgeon to the Hôpital de la Charité at Paris, and afterward prof., first of operative surgery, then of clinical surgery, at the École de Santé. In 1804, he was appointed first surgeon to the emperor, who raised him to the rank of baron. He accompanied the emperor on his campaigns and journeys. After the Restoration B. became prof. of practical surgery in the Univ. of Paris, and first surgeon at the Hôpital de la Charité. In 1823 he was appointed consulting surgeon to the king; and 1825, was admitted a member of the Institute. His greatest works are his *Traité Complet d' Anatomie*, 4 vols. (Par. 1797–99, and other editions), and his *Traité des Maladies Chirurgicales et des Opérations qui leur conviennent*, 8 vols. (Par. 1814–22). From 1798 to 1817, he was engaged with Roux and Corvisart in conducting the *Journal de Médecine, Chirurgie et Pharmacie.*

BOYER, Jean Pierre: president of the republic of Hayti: 1776, Feb. 2—1850, July; a mulatto, b. at Port-au-Prince, cap. of that part of the island then belonging to France. At a very early age he was sent to France, where he received a European education, and in 1792, entered the military service and fought against the British on their invasion of his native isle. He soon joined the party which sought the complete emancipation of the colony. B., with Péthion, assisted Christophe to overthrow the bloody negro tyrant Dessalines 1806, but deserted Christophe when he attempted to make himself

sovereign. Péthion established an independent republic in the w. part of the island; and B. was invested by the new president with the command of the capital, Port-au-Prince, and the rank of maj.gen., in which position B. showed much military and administrative capacity, and was recommended by Péthion, when dying, as most worthy to be his successor; and was unanimously elected pres. of the republic. He arranged the finances, collected funds, improved the administration, and encouraged education. After the death of Christophe, he united the monarchical part of the island with the republic in 1820; and in 1821, the e. district also, which had remained under the dominion of Spain; and he obtained recognition of the independence of the youthful state by France 1825, on payment of an indemnity of 150 millions of francs. B. carried on the government of the republic of Hayti for 15 years, from this time in peace; but his policy was arbitrary and tended to depress the negroes in favor of his own race (the mulatto); and an insurrection 1843 caused B.'s flight to Jamaica, whence he announced his resignation to the Haytian revolutionary committee, and consigned himself to a voluntary ostracism. See HAYTI. B. died in Paris. He was a man of great perseverence, and of captivating manners; but artful, and often harsh and cruel to those under him.

BOYESEN, *boy'ė-sĕn*, HJALMAR HJORTH: author: 1848, Sep. 23—1895, Oct. 4; b. Fredericksvœrn, Norway. He was educated in the Christiania Gymnasium, the Univ. of Leipsic, and the Univ. of Norway. After graduating 1869, he emigrated to the United States, and was editor of a Scandinavian journal in Chicago till 1874, when he became prof. of German in Cornell Univ. From 1880 till his death he held a like chair in Columbia Coll. He quickly acquired perfect mastery of English, and wrote many admirable tales, sketches, and essays, and translated several stories from the Norwegian. Among his tales and romances are: *Gunnar—a Norse Romance; Falconberg; A Daughter of the Philistines; The Mammon of Unrighteousness; The Light of Her Countenance.* His story of Norwegian life, *Gunnar*, published in the *Atlantic Monthly* (1873), and his *Idyls of Norway and Other Poems* (1883), give proof of his rare imaginative faculty and his deep human sympathies. Besides these, he wrote: *Tales from Two Hemispheres* (1875); *A Norseman's Pilgrimage* (1876); *Goethe and Schiller: Their Lives and Works* (1878); *Ilka on the Hill-Top* (1881, dramatized 1884); *Queen Titania* (1882); *Story of Norway* (1886). Some of his works have been translated into German, etc. He was a founder of the New York Authors' Club. The *Story of Norway* is a children's history. In *Essays on German Literature* his chief themes are the different phases of the genius of Goethe and Schiller, evolution of the German novel, influence of the romantic school.

BOYLE, *boyl:* town in Roscommon co., Ireland, in a pic-

turesque valley on both sides of the Boyle, one m. above its expansion into Lough Key, and 8 m.n.w. of Carrick-on-Shannon. It has a large trade in corn and butter. Latin and English annals of B. date from 420 to 1245, and have been published. An abbey was built here in the 12th c., and was reduced to its present ruined state 1595 by the Earl of Tyrone. Pop. 3,000.

BOYLE, CHARLES, fourth Earl of Orrery: 1676, Aug.—1731; b. Chelsea. Entered Christ-Church, Oxford, in his 15th year. He was the nominal editor of a work on the *Epistles of Phalaris*, which was the work chiefly of his tutors, Drs. Atterbury and Friend. This publication brought on the 'Battle of the Books' (1695–98), with the result that the unfortunate B. was a victim, with his coadjutors, of Bentley's merciless criticism (see BENTLEY). In honor of B. the name 'Orrery' was given to the scientific apparatus of that name by its inventor, to whom B. had been kind. He fought as maj.gen., at Malplaquet, held court appointments, and wrote literary pieces. Of his poems, Sir Richard Blackmore said:

> After his foolish rhymes, both friends and foes
> Conclude they know *who did not write his prose.*

BOYLE, DAVID, Canadian ethnologist: b. Greenock, Renfrewshire Scotland, 1842, May 1. He went to Canada in 1856, and was first a blacksmith and then a teacher. He later took up geology and discovered the fossils *murchisonia boylei*, named in his honor. He has, for 15 years, been curator of the Archæological Museum at Toronto. He has written *Notes on Primitive Man in Ontario* and similar works.

BOYLE, RICHARD, Earl of Cork, founder of the house of Cork and Orrery, styled the Great Earl of Cork: 1566–1644; b. Canterbury, Eng., of a good but not wealthy family. At the age of 22, after having studied at Cambridge and the Middle Temple, he went over to Ireland with a few pounds in his pocket, to hew his way to fortune. His energy, prudence, and signal capacity for government, received their reward. He bought estates and improved them, promoting the immigration of English Protestants, and triumphed over the envy of his enemies, making good his cause before Queen Elizabeth, and winning her favor. Due honors flowed in upon him, and at length he was knighted. In 1620, he became Viscount Dungarvan and Earl of Cork. In 1631 he was made lord high treasurer, an office which remained hereditary in his family. In his old age, the Munster rebels compelled him to gird on armor and turn his castle into a fortress. He soon raised a little army of his servants and tenants, and with an auxiliary force commanded by his four sons (and paid, when his money was spent, out of his plate-chest), the noble old earl took castles, smote the rebels, and quenched rebellion in his borders.

BOYLE, The Hon. ROBERT: 1626, Jan. 25—1692, Dec. 30; b. Lismore, Waterford, Ireland; seventh son and

fourteenth child of the first Earl of Cork. As a child he was distinguished by precocity of intellect and a rare love of truth. After studying at Eton, and at home, he went to the continent for six years. On his return, 1644, he found himself in possession, by his father's death, of the manor of Stalbridge, Dorsetshire, where he resided till 1650. He took no part in political strife, but applied himself to science, particularly chemistry and natural philosophy. He was one of the first members of that association of scientific men which about that time (1645) held private meetings at Oxford and London, and some years later became better known as the Royal Soc. In 1654, he settled at Oxford. Here he experimented extensively in pneumatics, and improved the air-pump (see MARIOTTE, LAW OF). At the same time he studied theology. After the Restoration, he was urgently advised by Lord Clarendon to enter the priesthood, but declined, thinking to do better service to religion as a layman. Among the proofs which he gave of this, beside his own theological writings and Christian example, were his exertions as a director of the E. India Company for propagation of Christianity in the East, his supplying the funds for publishing Eliot's Indian Bible, his aid to the Soc. for Propagation of the Gospel in New England (originally a Puritan soc.), and his bequest for the 'Boyle Lectures' (q.v.). In 1668 he removed to London, and thenceforth gave much of his time to the business of the Royal Soc. In 1680, he was chosen pres., but declined the honor. A peerage had repeatedly been offered to him, and declined. In 1688, finding his health decline, he shut himself up against all interruption, in order to husband his remaining time for the labor of repairing the loss caused by the accidental destruction of his MSS. In 1691, his health finally gave way, and, 1692, Dec. 30, he died, seven days after his beloved sister, Lady Ranelagh. B. was tall and emaciated in person, and extremely temperate in his habits, often subject to low spirits, but naturally lively and of rare conversational powers. His piety, benevolence, and charity would have made him remarkable, apart from his scientific attainments and reputation. His complete works (including his very interesting correspondence), with a life by Dr. Birch, and an index, were published in 5 vols. fol. (Lond. 1744).

BOYLE LECTURES, so called from the founder, Robert Boyle (q.v.) who left a bequest amounting to $250 annually for the delivery of eight lectures a year in defense of the Christian religion as opposed to other religions and to atheism, 'not descending to any controversies among Christians themselves.' The lecturers may be appointed for three years. The lectures are given in the Church of St. Mary-le-Bow, London. The first series of lectures was given by Richard Bentley in 1692. All the lectures given before and including 1732 were collected into a fine folio edition, 3 vols. (Lond. 1739); since that period, till recently, few of the lectures have been published. Among Boyle lecturers whose discourses have

been published since 1860 are: J. D. Maurice, C. Merivale, E. H. Plumtre, J. A. Hessey, and H. Wace.

BOYLE'S FUMING LIQUOR: a concentrated solution of ammonia, saturated by a stream of hydrosulphuric acid, which, combining, with it forms the sulphide of ammonium (NH_4S). Exposed to the air, it fumes, and evolves a very disagreeable odor, resembling, but in an intensified degree, ordinary bilge or sewerage water.

BOYNE, *boyn:* river in the e. of Ireland, discharging its waters into Drogheda Bay, an arm of the Irish Sea, about 25 or 30 m. n. of Dublin. The B. rises in the Bog of Allen, and, in its course of about 65 m., passes Trim, Navan, Slane, and Drogheda, entering the sea about 3 m. below the last town. On its banks are many ruins of castles and monasteries. Vessels of 259 tons can ascend to Drogheda, and those of 70 tons 19 m. further to Navan. Its chief tributaries are the Deel, Mattock, and Blackwater. Turgesius, the Dane, sailed up the B. on a plundering expedition 838. But the B. is especially famous for the victory gained by William III. over James II., 1690, July 1 (New Style, July 12). An obelisk 150 ft. in height, erected 1836, marks the place. When William of Orange was crowned (1689, Feb. 22) king of England, a reaction soon took place in favor of the exiled James II. Almost all Ireland rose in arms, and behind it appeared France and Louis XIV., who had received under his protection the fugitive monarch. After some maneuvers and delays in the campaign, the two armies finally joined battle on the banks of the B., the armies being at first on opposite sides of the river, several miles from Drogheda. The exiled Rom. Catholic king had about 30,000 men; and William III. about 36,000. Great valor was displayed by both armies. The loss in dead and wounded was not great —that of James II. being about 1,500, and of the English about 500; but the consequences were immense; and the new king became firmly established on his throne.

BOYNTON, *boyn'ton*, Henry Van Ness: journalist: b. West Stockbridge, Berkshire, co., Mass., 1835, July 22; son of Charles B. B., a former chaplain of the U. S. house of representatives and prof. in the U. S. Naval Academy. He removed with his father's family to Cincinnati 1846; graduated at the Ky. Milit. Acad. 1858; and was retained in the faculty as prof. of mechanics and astronomy. Resigning at the outbreak of the civil war, his milit. training enabled him to render the govt. valuable assistance in organizing and drilling new regiments. He was commissioned maj. 25th O. vols. 1861, July 27; promoted lieut.col., and commanded the regt. at Chickamauga, Missionary Ridge—where he was severely wounded —and Buzzard's Roost; and brevetted brig.gen. for his heroism in the first two battles. After the war, he settled in Washington, achieved fame as a newspaper correspondent, wrote *Sherman's Historical Raid: the Memoirs in the Light of the Record: a Review Based upon*

Compilations from the Files of the War Office (a criticism of Gen. Sherman's *Memoirs*, Cincinnati 1875), and headed the opposition to Pres. Cleveland's order for the return of the Confederate battle-flags 1887. D. June 3, 1905.

BOYS, Ships': in nautical language, all the young or raw hands on board ship; called *boys*, without much reference to their age. The British admiralty has, in recent years, made many regulations for attracting boys into the navy and as boys they enter mostly at about 14 years of age. There are schools established for them at Portsmouth, Plymouth, Cork, and one or two other places.

In the United States, training ships and school ships serve a purpose somewhat similar.

BOYTON, *boy'ton*, Paul: swimmer: b. Dublin, Ireland, 1848, June 29. He served in the U.S. navy 1863–65; gained some experience in submarine diving; was in the life-saving service on the Atlantic coast 1867–69; enlisted as a *Franc-tireur* in the Franco-Prussian war 1870–1; visited the s. African diamond-fields; returned to the United States, and organized a life-saving brigade to operate during the bathing season at Atlantic City, N. J. With his patent rubber life-saving dress, he crossed the British Channel in 24 hours 1875, May 28; paddled on the Rhine from Basel to Cologne, 430 m., 1875, Oct.; went 460 m. down the Danube in six days 1876, May; traversed the chief rivers of Europe, and crossed the Straits of Gibraltar. In America he paddled from Oil City, Penn., to the mouth of the Mississippi, 2,342 m., in 80 days, and in 1879 crossed from Long Branch to Manhattan Beach, and descended the Connecticut river from Canada to the Sound. During 1881, Sep. 17—Nov. 20, he made a voyage down the Missouri from Montana to St. Louis, 3,580 m., and 1888 made a floating voyage down the Ohio river. He published *Roughing It in Rubber* (1886).

BOZEMAN, *bōz'man:* city, cap. of Gallatin co., Mont.; on the e. Gallatin river and the Northern Pacific railroad; 98 m. s. by s.e. of Helena. It is an agricultural and stock-raising country, with rich mines of gold, silver, coal, iron, and argentiferous galena in its immediate vicinity, and is supplied with a costly system of irrigation by a canal 20 m. long which also serves as a waterway. Stone quarries, lumber mills, flour mills, breweries, brick yards represent some of the industrial interests, and at B. are the State College of Agriculture and Mechanical Arts, a public library and many fine buildings and institutions. Pop. (1910) 5,107.

BOZRAH, *boz'râ*, or Bos'tra: very ancient city of Syria, pashalic of Damascus, 76 m. s.s.e. of Damascus, on a tributary of the Jordan. The surrounding country lies uncultivated, the walls are tumbling down, the mosques are without roofs, the houses ruined to their foundations, and one must grope far before reaching five or six families, which constitute the whole population of the present B. Although very ancient B. is not mentioned in

history until the time of the Romans. Under Trajan (105) it was made the metropolis of the province of Arabia, and took the name of *Nova Trajana Bostra*, which we find upon the medals of that epoch. The Emperor Philip the Arab, who ascended the throne 245, was born at B. He added to the adornments of his natal city, which was later the seat of a bishopric. Its decline dates from the Mussulman conquest; its complete ruin from the crusades in 1180, when it was ravaged by the Turks. Some claim, however, that B. was still a populous place in the 14th c.

In Idumæa (Edom) at the s. of Palestine, on the route from Hebron to Petra, there was another B., regarded as the cap. of that country.

BOZZARIS, *bot'sâ-ris*, Marcos: Greek patriot in the early part of the modern war of independence: born Suli, in the mountains of Epirus, toward the close of the 18th c.; d. 1823, Aug. 20. His youth was spent amid the din of arms. In 1803 he was forced to retreat to the Ionian Isles, by Ali Pasha (q.v.), who, in a series of bloody combats, had nearly exterminated the Suliotes. In 1820, two events occurred which called forth his patriotic energies: Hypsilanti summoned the Greeks to insurrection, and war broke out between Ali Pasha and the sultan. On learning the news, B. put himself at the head of some 800 expatriated Suliotes, and passed over into Epirus. Ali, who dexterously endeavored to identify his cause with that of the Greeks, soon found means to secure B.'s services against their common enemy, the sultan. B. obtained several victories, and on the death of Ali at the taking of Janina, 1822, he continued the war successfully against Khurshid Pasha, the Turkish general. Shortly afterward Prince Mavrocordato landed at Mesolonghi, with a body of disciplined troops, and being joined by B., he engaged the Turks at Petta, 1822, July 16. Through treachery the Greeks were overpowered, their best soldiers perished, and B., with Mavrocordato, was compelled to retire to Mesolonghi. This place he skilfully defended against the Turks, until a Hydriote fleet forced them to retire. In the summer of 1823, a Turco-Albanian army of 20,000 men, under the command of the Pasha of Scodra, descended from the n. of Epirus. B., who knew that the fortifications of Mesolonghi were too weak to withstand an assault, determined to surprise his enemies by a sudden blow. He advanced swiftly at the head of 1,200 men, and on Aug. 20 reached Kerpenisi, where the van of the Turco-Albanian army, 4,000 strong, was encamped. At night, the Suliotes burst in upon their startled foes, who were routed with great slaughter. The victors captured their camp, standards, and a vast quantity of baggage. This triumph was saddened by the loss of the heroic B., who fell while leading on his men to the final attack. His body was solemnly interred at Mesolonghi, and he was honored with the title of the 'Leonidas of Modern Greece.'

BOZZOLO, *bot'so-lo:* town of n. Italy, province of

Mantua, on the right bank of the Oglio, about 16 m. w.s.w. of Mantua. B., which was at one time a small independent republic, has remains of old fortifications, some silk-weaving, and an annual fair. Pop. about 4,500.

BRA, *brâ:* town in the province of Cuneo, n. Italy, 25 m. n.e. of Coni. It has metal foundries and silk manufactures, and a good trade in cattle, grain, and wine. Pop. 10,500.

BRABANÇONNE, *bră-bawng-sŏn:* the patriotic song of the Belgians, originally sung by the insurgents during the revolution of 1830, Sep. A young French player, by name Jenneval, at that time connected with the theatre at Brussels, was the author of the song; it was set to music by a singer named Campenhout. Jenneval fell in a combat with the Dutch at Berchem. The Belgians allowed his mother a pension of 2,400 francs. Campenhout received from King Leopold a golden snuff-box, and was appointed director of the royal chapel. Each verse of the B. ends with the refrain:

La mitraille a brisé l'orange
Sur l'arbre de la liberté.

BRABANÇONS: in the middle ages, adventurous fighters, scarcely better than banditti, from Brabant and neighboring provinces, who served for hire under any leader who would pay.

BRABANT, *brâ'bant* or *brâ-bânt':* former name of an important province of the Low Countries, extending from the left bank of the Waal to the sources of the Dyle, and from the Maas and the plain of Limburg to the Lower Scheldt. In the time of Cæsar, B. was inhabited by a mixed race of Germans and Celts; it afterward came into possession of the Franks, and in the middle ages it formed a duchy by itself, dependent upon Lower Lorraine, with which, 1107, the county of Antwerp was incorporated, and in 1347, for a time, the lordship of Mechlin or Malines, formerly connected with Liège. After many changes, B. (divided into the provinces of North and South B.) was made a part of the kingdom of Holland, at the Congress of Vienna; but at the revolution of 1830, South B. separated from Holland, and became part of Belgium (q. v.). Old B. is now divided into three provinces: 1. North or Dutch B., 1,960 sq. m.; 2. The Belgian province of Antwerp, 1,094 sq. m.; 3. South B., also Belgian, 1,260 sq. m. The country consists of a plain gently sloping to the n.w., and rising in the s. into gentle hills, which are offsets of those of the Ardennes. In the level northern part are many heathy and fenny tracts; one of them, a morass called the Peel, is 20 m. in length, and from 2 to 6 broad. In the hilly district of the s. is the Forest of Soignies. The Maas and the Scheldt are the principal rivers; but some of their tributaries also are useful for internal commerce, which is further promoted by canals and railways. The soil of North B. is fertile, and wheat, rye, oats, barley, beans, potatoes, beet, colza, madder, flax, and hay are extensively grown; also hops,

tobacco, and chicory. Farm stock is large. Principal towns are: Hertogenbosch, Tilburg, Breda, and Bergen-op-zoom. Soap-boiling, distilling gin, book-printing, refining salt, making beet-sugar, beer, cigars, thread, woolen cloths, leather, earthenware, weaving and printing cottons, Turkey-red dyeing, are chief industries. B. lace has long been celebrated. The inhabitants in the n. are Dutch; in the middle district, Flemish; and in the s. of Walloon race. The boundary between the languages is a few leagues s. of Brussels, the Walloon French being spoken to the s., and Flemish and Dutch to the n. of this line. Pop. (1901) North or Dutch B., 566,551; Belgian province of Antwerp, 819,159; South B. (also Belgian), 1,263,535.

BRABBLE, v. *brăb'bl* [Dut. *brabbelen*, to stammer—an imitative word; comp. Gael. *breabail*, a kicking, quarrelling—from *breab*, to kick]: in *OE.*, to contest in words with the confused noise of simultaneous talking; to clamor; N. noisy and confused talk, noisy clamor. BRABBLING, imp. *brăb'blĭng*. BRABBLED, pp. *brăb'bld*. BRABBLER, n. *brăb'blėr*, a quarrelsome, noisy fellow.

BRACCATE, a. *brăk'kāt* [L. *braccatus*, wearing trousers]: *Ornithol.*: furnished with feathers which conceal the feet.

BRACCIO, *brât-chō*, FORTEBRACCI, Count of MONTONE: 1368–1424, June 5; b. Perugia, Italy: a celebrated condottiere (see CONDOTTIERI). He was in early youth leader of a troop of mercernaries; championed the Perugian nobles when driven into exile 1393; entered the service of the king of Naples 1408; obtained the sovereignity of Perugia 1416; and captured Rome 1417, but was soon forced to evacuate it. He was crowned Prince of Aquila and Capua 1423, and while aspiring to the throne of Naples he was wounded and captured in battle, and only survived three days.

BRACE, n. *brās* [containing the idea of straining, compressing, or confining: F. *bras;* OF. *brace*, the arm, strength: It. *braca*, a rope resisting a strain: L. *brachĭă*, arms of the body (see BRAKE 1): that which holds anything tight or supports anything; a couple or pair, not united by a physical tie, but only in the mode of viewing them; a mark in printing—thus, }; a rope at the end of a yard for moving it: V. to draw together; to bind; to support; to strengthen. BRA'CING, imp.: ADJ. giving strength or tone. BRACED, pp. *brāst*. BRACES, n. plu. *brās'ĕs*, supporters for trousers. TO BRACE A YARD, to bring it to either side by braces.

BRACE, in Carpentry: oblique piece of wood used to bind together the principal timbers of a roof or other wooden structure: see ROOF: BORING.

BRACE, CHARLES LORING: 1826, June 19—1890, Aug. 11; b. Litchfield, Conn.: philanthropist and author. He graduated at Yale 1846, and studied divinity in the Yale Divinity School and in Union Theol. Seminary,

New York. He travelled afoot in the British Islands and on the continent of Europe 1850–1, and was imprisoned for one month at Grosswardein, Hungary, under suspicion of being a revolutionary agent. On his return to the United States 1852, he began his philanthropic labors for the poor and outcast population of New York, and founded a missionary establishment in a locality called the Five Points, then inhabited by the most degraded elements of the city's population; the Children's Aid Soc. he founded 1853, and the Newsboys' Lodging-house 1854; an Italian industrial school 1855, and a similar school for German children 1856. In the latter year he travelled through Norway and Sweden; made a sanitary investigation of English cities and towns 1865, after which he made another pedestrian journey on the continent of Europe, this time in the Tyrol; he revisited Hungary and Transylvania 1872. He was a frequent contributor to the periodical press. His published books are: *Hungary in* 1851; *Home Life in Germany* (1853); *Norse Folk* (1857); *Races of the Old World* (1863); *The New West* (1869); *The Dangerous Classes of New York* (1872); *Gesta Christi*, a history of humanitarian ideas under Christianity (1883); *The Unknown God*, a history of the different forms of religion. (1889). He was succeeded as sec. of the Children's Aid Soc. by his son, Charles L. B., Jr.

BRACELET, n. *brās'lĕt* [F. *bracelet*—from OF. *brasselet*, a bracelet: Sp. *bracil*, armor for the arm—from F. *bras;* OF. *brace*, the arm—from OF. *brasse*—from L. *brachĭŭm*, the arm (see BRACE)]: an ornamental band for the arm, worn usually at the wrist. Bracelets and armlets (Lat. *armillæ*) have been used by every nation, both savage and civilized, from the earliest periods. They are frequently mentioned in Genesis, as worn by men (xxxviii. 18) and by women (xxiv. 30); both by the Hebrews and the surrounding nations (Num. xxxi. 50). Similar ornaments were worn round the ankles, but they are stigmatized by Isaiah as marks of luxury (iii. 16). The Medes and Persians were remarkable, even among Asiatics, for their love for ornaments, of this class. They wore not only bracelets and armlets but earrings, collars, and necklaces, which often consisted of strings of valuable pearls, or were enriched with other jewels. These ornaments were used to indicate the rank of the wearer, and this use has continued in the East to the present day. In Europe, bracelets and armlets were worn both by the classical nations and by barbarians from the earliest times. The Gauls wore them, and the Sabines, as early as the foundation of Rome, had ponderous golden armlets on the left arm. The same was the case with the Samians about the same period. It does not appear that armlets were worn by men during the historical period of Greece, but women wore both armlets and bracelets of most various materials and forms. Both generally passed round the arm several times, and a modern form of B.

has been accurately copied from those twisted spirals described by Homer in the eighteenth book of the *Iliad*, line 401. We are indebted to the Greeks even for the idea of giving to these spiral bracelets the form of a snake, the best models of our present goldsmiths being exact copies of antique bracelets. The goddesses of the Greeks, like the blessed Virgin in Rom. Cath. countries, were represented as attired in the style of ladies of the highest rank; and the celebrated marble statue of Aphrodite, preserved at Florence, exhibits traces of a metallic armlet. Among the Romans, armlets were frequently conferred upon soldiers for deeds of valor. Roman ladies wore bracelets, not only for ornament, but also for the purpose of containing amulets, which were supposed to effect miraculous cures. On this principle it is said that the Emperor Nero wore on his right arm the skin of a serpent, inclosed in a golden armilla. But at Rome also, it was chiefly as an indication of rank or wealth that these ornaments were worn. Many Roman bracelets have been preserved.

BRACES, on Shipboard: ropes attached to the yard-arms, and employed to shift the sails in a horizontal direction round the masts, so as to receive the wind advantageously. The phrases, 'to brace to,' 'to brace about,' 'to brace the yards sharp up,' etc., apply to this operation.

BRACH, n. *brāk*, or BRACHE, *brāch* [OF. *brache;* F. *braque*, a hunting-dog: Prov. *braquet* or *brachet*, a dog that hunts by scent: Gael. *brachach*, a large gray dog: *brach*, a bear]: a dog used in tracking game; a shaggy dog; a dog used by poachers. The word is frequently employed by the older English authors, but the exact kind of dog referred to is not known.

BRACHIAL, a. *brāk'kĭ-ăl* [L. *brachĭŭm*, the arm: Gr. *brachion:* It. *braccio*]: of or pertaining to the arm. BRA'CHIATE, a. *-kĭ-ăt*, in *bot.*, having opposite pairs of branches placed at right angles to each other. BRACH'IOPODA, n. plu. *brăk'ĭ-ŏp'ŏ-dă*, also BRACH'IOPODS, *pŏds* [Gr. *pous* or *poda*, a foot]: a class of Mollusca with one shell on the back and another in front, and having two long spiral ciliated arms developed from the sides of the mouth; the lamp-shells. BRACHIUM, n. *brăk'ĭ-ŭm*, the upper arm of vertebrates. BRACHIA, n. plu. *brăk'ĭ-ă*.

BRA'CHIAL ART'ERY: that portion of the great arterial trunk supplying the upper extremity between the armpit and the elbow; in other words, it is the continuation downward of the axillary artery. The B. A. runs along the inner side of the arm just behind the inner margin of the biceps muscle, and behind the great median nerve. Here it may be pressed against the bone, in cases of bleeding from any point below. In its course, the B. A. gives off, 1*st*, the superior profunda branch, which winds round the back of the arm-bone, and reappears on the outer side, where it joins some twigs coming up from the radial artery; 2*d*, an artery which enters the bone to supply its medullary membrane; 3*d*, the inferior profunda.

which, running down behind the internal condyle (the funny bone) of the humerus, joins branches coming from the ulnar artery; *4th*, a short branch, the anastomotica magna which breaks up into numerous branches inosculating round the elbow.

BRACHIOPODA, *brăk-ĭ-ŏp'ŏ-dă*, the class of shelled worms, formerly placed among mollusks. The class is named Brachiopoda on account of the feet-like arms, fringed with tentacles, coiled up within the shell. The shell is much like an old Roman lamp in shape, the ventral and larger valve being perforated at the base, for the passage through it of a peduncle by which the animal is attached to rocks. The shell is formed by secretions from the skin. The body of the B. is divided into two parts, the anterior comprising the main body cavity in which the arms and viscera are contained, and the caudal portion or peduncle. The body-cavity containing the viscera is closed anteriorly by a membrane which separates it from the space in which the arms are coiled up. The pallial chamber is situated between the two lobes of the mantle (*pallium*) and in front of the membrane separating the body cavity from the arms. In the middle of this pallial chamber the mouth opens, bounded on each side by the base of the arms. The digestive system consists of a mouth, œsophagus, stomach, with a liver mass on each side, and an intestine; the stomach is simply a dilatation of the alimentary canal.

The larva is active, swimming rapidly. In their development the B. recall the larvæ of the true worms. They also resemble the adult worms in the general arrangement of the arms and viscera, but they lack the highly developed nervous system and the segmentation of the body which are characteristic of the worms. They are also closely related to the Polyzoa, and at the same time have some molluscan features, such as the solid shell, though they have nothing homologous with the foot, the shell-gland or odontophore of mollusks. Being a very generalized type, the species have a high antiquity; nearly 2,000 fossil species are known and only 80 or 90 living species. All are marine, most of them except those belonging to the genus Lingula live in temperate or arctic seas. Lingula is largely tropical; of this genus one species *Glottidia pyramidata* is frequent on U. S. coasts from Chesapeake Bay to Florida where it lives buried in the sand just below low-water mark.

BRACHT, *bräht*, Felix Prosper Eugen, German artist, b. Morges, Switzerland, 1842. He is best known as a landscape artist. He studied at Carlsruhe and Düsseldorf, and in 1882 was appointed a professor in the Berlin Academy. Among notable paintings by him are *Stormy Evening on Rügen; Moonlight Night in the Desert; Nightfall on the Dead Sea.* The last named work, now in the National Gallery of Berlin, is considered his best.

BRACHVOGEL, Emil, *ā'mēl brah'fō-gĕl*, German novelist and dramatist: b. Breslau, 1824; d. 1878. He

is best known by his drama, *Narcisse* (1857), which attained many editions and was translated into various European tongues. *Beaumarchais* (1865); *Benoni* (1860); and *Glencarty* (1872).

BRACHY, a. *brăk′ĭ* [Gr. *brachus*, short]: a word frequently made use of in scientific compounds as a prefix, and signifying 'short.' BRACHYPTEROUS, a. *brăkĭp′-tėr-ŭs* [Gr. *pteron*, a wing]: having short wings. BRACHYURA, n. plu. *brăk″ĭ-ū′ră* [Gr. *oura*, a tail]: a tribe of the decapod crustaceans having short tails, as the crabs. BRACHYURUS, a. *brăk′ĭ-ū-rŭs*, short-tailed. BRACHYGRAPHY, n. *bră-kĭg′ră-fĭ* [Gr. *grapho*, I write]: art or practice of writing in a short compass; stenography. BRACHYG′RAPHER, n. one who. BRACHYLOGY, *bră-kĭl′ŏ-jĭ* [Gr. *logos*, a word or term]: conciseness of expression.

BRACHYCEPHALI, n. plu. *brăk′ĭ-sĕf′ă-lī* [Gr. *brachus*, short; *keph′alē*, the head]: a short headed ancient race of men in Britain; opposed to DOLICHOCEPH′ALI, (q.v.), long-skulled races. BRACHYCEPHALOUS, a. *brăk′ĭ-sĕf′ă-lŭs*, short headed; also BRACHYCEPHALIC, a. *brăk′ĭ-sĕ-făl′ĭk*, short-headed—applied to the form of the head in animals.

BRACHYDIAGONAL, n. *brăk-ĭ-dī-ăg′o-nal* [Gr. *brachus* short; Eng. *diagonal*]: in *geom.*, the shortest of the diagonals in a rhombic prism. BRACHYSTOCHROME, n. *brăk-ĭs′-tō-krōm* [Gr. *brachistos*, shortest; *chronos*, time]: in *geom.*, the curve of quickest descent, *i.e.*, the curve starting from a given point in which a body descending by the force of gravity will reach another point in the curve in a shorter time than it could have done had it traversed any other path. The curve in question is the cycloid (q.v.).

BRACHYPTERÆ, *bră kĭp′tėr-ē:* PYGOPODES; formerly in Ornithology that section of the order of *Palmipedes* (q.v.) or web-footed birds, in which the wings are short, and the feet are placed far back, so as to compel the birds to assume a nearly erect posture when on land. They are all very aquatic in their habits, and excel in diving, so that the name DIVERS is sometimes used as equivalent to B.; but that name is also not unfrequently applied to other aquatic birds and is sometimes restricted to the genus *Colymbus*. Auks, puffins, penguins, grebes, guillemots, and divers (*Colymbus*) are among the Brachypteræ.

BRACKEN, n. or a. *brăk′ĕn* (Sw. *bräken;* Icel. *burkni*, fern: *W. bruk*, heath: Icel. *brok*, sedge, rough grass (see BRAKE 3)]: ferns; the *Pteris aquilīna*, ord. *Filĭcēs*, or Fern family.

BRACK′ENBURY, *brăk′ėn-bėr-ĭ*, CHARLES BOOTH, English soldier and military writer: b. Bayswater, Middlesex, 1831, Nov. 7. He served in the Crimean war in 1855; accompanied the Prussian army in the war with Austria (1866), and the Franco-Prussian war (1870–71), and was with the Russian army in the Russo-Turkish war (1877–8). His works include *European Armaments* (1867); *The Winter Campaign of Prince Frederick Charles in* 1870–71; *Reforms of the French Army* (1874), etc.

BRACKENBURY, Sir Henry, English soldier: b. Bolingbroke, Lincolnshire, September 1837. He entered the Royal Artillery in 1856, served in the central Indian Ashanti and Zulu campaigns and was made lieutenant-general in 1888, and was director-general at the war office 1899 to 1904. He has published *Fanti and Ashanti* (1873); *Narrative of the Ashanti War* (1874); *The River Column* (1885).

BRACK'ENRIDGE, *brak'ĕnrĭj*, Henry Marie, American author: b. Pittsburg, Pa., 1786, May 11; d. there 1871, Jan. 18. He was educated by his father, H. H. Brackenridge (q.v.) and admitted to the bar 1806. In 1811 he descended the Mississippi River in a 'keel-boat' to New Orleans, and was soon appointed deputy attorney-general for the then territory of Orleans, becoming district judge in 1812. In 1817 he was secretary to the commission sent to the South American republics, and in 1821 was appointed U. S. judge for the western district of Florida, holding it until he removed to Pittsburg in 1832. His knowledge of the French and Spanish languages and laws made him of considerable service to the government in all affairs connected with the Louisiana and Florida purchases. He wrote *Views of Louisiana in* 1810 (1812); *Letter to Mr. Monroe by an American; Voyage to South America in* 1817–18 (1818); *History of the Late War* [1812] *between the United States and Great Britain; Recollections of Persons and Places in the West* (1834); *Essays on Trusts and Trustees* (1842); *History of the Western Insurrection* (1859), a vindication of his father's share in that affair.

BRACKENRIDGE, Hugh Henry, American jurist: b. near Campbelton, Scotland, 1748: d. Carlisle, Pa., 1816, June 25. He came with his father to the United States at the age of five, and was graduated from Princeton in 1771. During the American Revolution he was a chaplain in the army. After being admitted to the bar he removed to Pittsburg, became prominent in his profession, and during the 'Whiskey Insurrection' (1794) was influential in bringing about a settlement between the government and the malcontents. In 1799 he was appointed to the supreme bench of Pennsylvania. A man of literary tastes, he wrote a number of pieces much thought of in their day. At his graduation he wrote (with Philip Freneau) a poetical dialogue *The Rising Glory of America.* Other works by him are *Incidents of the Insurrection in Western Pennsylvania* (1795); *Law Miscellanies* (1814); *Modern Chivalry, or the Adventures of Captain Farrago and Teague O'Regan, His Servant,* a political satire and his best work (1st Pt. 1796; 2d, 1806).

BRACKET, n. *brăk'ĕt* [Gael. *brac,* an arm: F. *brague,* a mortise for holding things together: Piedm. *braga,* an iron for binding anything together (see Brace)]: primarily, a cramp-iron holding things together—then a support cramped or fastened to a wall; a piece of wood or metal placed for supporting anything, generally against a wall;

crooked lines used in printing—thus, [ ]—to mark off or isolate a part of the text of a book: V. to place within brackets; to join two or more names of candidates as a mark of equality in the result of an examination. BRACK'ETING, imp. BRACK'ETED, pp. BRACKET-LIGHT, a light projecting from a side wall.

BRACK'ET: ornamental projection from a wall, for the purpose of supporting a statue, bust, or the like: (see CORBEL). Brackets may be either of stone or wood, and they are sometimes elaborately designed and carved. The term B. is also employed in joinery, etc., to designate supports, in the form of a bent knee, of shelves, galleries, etc. B. is often applied also to projecting gas fixtures.

BRACK'ETT, *brăk'ĕt*, ANNA CALLENDER, American educator: b. Boston, 1836 May. 21. She taught in various normal schools, being the first woman principal of such an institution, and was principal of a private school for girls in New York for 20 years. She has published *Education of American Girls* (1874); *Philosophy of Education*, from the German (1886); *Technique of Rest* (1892); *Woman and the Higher Education* (1893).

BRACKETT, FRANK PARKHURST, American mathematician: b. Provincetown, Mass., 1865 June 16. He graduated at Dartmouth College in 1887, and since 1890 has been professor of mathematics and astronomy at Pomona College, Claremont, California. He has written several important mathematical and meteorological papers.

BRACKETT, GUSTAVUS B., American pomologist: b. Unity, Maine, 1827 March 24. He served in the Civil War, and, at its close, took up the study of horticulture and pomology. He served as an expert at the Paris Exposition (1878) and the Chicago World's Fair (1893), after which he became chief of the Division of Pomology in the United States Department of Agriculture.

BRACKETT, JOHN QUINCY ADAMS, American lawyer: b. Bradford, N. H., 1842 June 8. After studying law at the Harvard Law School he began the practice of his profession in Boston. He sat for several terms in the Massachusetts legislature (1877–82 and 1884–7), being speaker of the House (1885–7); was lieutenant-governor of the State (1887–90), and governor of Massachusetts (1890–91).

BRACKETT, *brăk'ĕt*, WALTER M.: painter: b. Unity, Me., 1823 June 14. After producing portraits and ideal heads—executing likenesses of many well-known persons, —he gained repute as painter of game-fish.—His bro. EDWARD AUGUSTUS B. (1819————; b. Me.), sculptor, noted for his portrait busts of eminent men.

BRACKISH, a. *brăk'ĭsh* [Gael. *brach*, fermented, corrupted: Dut. *brak*, brackish, briny: It. *braco*, a puddle: OF. *brac*, mud: Dut. *brack*, refuse]: not quite fresh; salt in small degree. BRACK'ISHNESS, n. saltness in small degree.

BRACQUEMOND, *brak-mawng*, JOSEPH FELIX, French

artist and engraver: b. Paris, 1833. He first exhibited in the Salon of 1852 and his etchings and reproductions of noted masters speedily brought him into notice. His portraits are especially prized and as an etcher he is represented by over 800 plates. He has invented a new method of china decoration and has done much work for the porcelain establishments at Limoges.

BRACT, or BRACTEA, *brăk'te-a*, in Botany: a leaf from the axil of which a flower or a floral axis is produced, instead of an ordinary leaf-bud or branch. Bracts are sometimes called floral leaves. The term B. is not, however, generally employed when, as is often the case, there is no marked difference from the ordinary leaves of the plant; but the flowers are said to be axillary, or in the axils of the leaves. On the other hand, the term B. is very frequently applied to all altered leaves interposed between the ordinary leaves and the flower or flowers. In this case they are sometimes very small and scale-like. The ordinary leaves often pass, by imperceptible gradations, into bracts, diminishing in size, becoming more simple, and often also scariose. Bracts are generally entire, even when the ordinary leaves are divided. They are sometimes colored so as apparently to form part of the flower, and sometimes crowded, so as to resemble an involucre or an outer calyx. They appear to serve purposes analogous to those of leaves, or, when colored, of petals. When the primary floral axis is branched, bracts (sometimes distinguished as *bracteoles* or *bractlets*) are often to be seen at its ramifications.

BRACTS, n. plu. *brăkts* [L. *bractĕă*, a thin leaf of metal]: in *bot.*, leaves more or less modified in form. BRACTEATE, a. *brăk'tĭ-āt*, having bracts. BRAC'TEOLE, n. *-tĭ-ōl*, or BRACTLET, n. *brăkt'lĕt*, a small bract at the base of the flower-stalk.

BRAD, n. *brăd* [Dan. *braad*, a goad; *bred*, an edge: Sw. *bradd*, an edge; *brodd*, a frost-nail]: a nail with little or no head. BRAD-AWL, an awl for piercing wood or leather to admit *brads* to be driven in more easily.

BRADBURY, *brăd'bẽr-ĭ*, WILLIAM BATCHELDER: pianoforte maker: 1816, Oct. 6—1868 Jan. 7: b. York, Me. Both his parents were excellent singers; he was master of many musical instruments at the age of 14, but first saw a pianoforte 1830. He taught singing in New York 1840–47; then studied harmony and composition in Germany; engaged with his bro., E. G. B., in pianoforte manufacture and music publishing in New York 1854. He was author or compiler of 59 separate books of music, which have had a total sale of 5,000,000 copies. The more important of his works are *Young Choir* (1841); *Flora's Festival* (1845); *The Golden Chain* (1861); *Pilgrim Song* (1863); *The Golden Trio* (1864); *The Shawm* (1684); *The Jubilee* (1865); *Temple Choir; Fresh Laurels* (1867), his last work.

BRADDOCK, *brăd'ok:* borough in Allegheny co., Penn.; on the Monongahela river, and on the Baltimore and Ohio, Pennsylvania and Pittsburgh, and Lake Erie railroads; 10 m. from Pittsburgh; in the centre of a coal-mining dist. Its principal industrial establishments are iron and steel works, wire, car, ferro-manganese, cement and plaster factories. B. has municipal waterworks, a public park, and a (Carnegie) free library. The first settlement made at B. was about 1795. It was incorporated as a borough 1868. Here, on the site of the old French fort Duquesne, Gen. Edward Braddock (q.v.) was defeated by the Indians and lost his life 1755. Pop. (1890) 8,561; (1900) 15,654.

BRAD'DOCK, EDWARD: soldier: abt. 1695—1755, July 13; b. Perthshire, Scotland. In the 'old French war' (see FRENCH WAR) in America, B., a maj.-gen. in the Brit. army, was sent to America to command the combined royal and colonial forces. He debarked at Hampton, Va., 1755, Feb. 20. George Washington was chosen his aide-de-camp. At Fredericktown, Benjamin Franklin, then postmaster-gen., was, busied in supplying the transportation service; and to him B. unfolded his plan of the campaign—first to take Fort Duquesne (on the site of Pittsburgh) in 3 or 4 days, then Niagara, then Frontenac. Thus B. was ignorant of the topography of the field of operations and of the kind of war in which he was to engage with savage foes. Franklin warned him of the perils of the expedition; but B. deemed it impossible that the savages could make any impression on the king's regular and disciplined troops. When the army had reached the neighborhood of the fort, July 9, the head of the column was attacked from ambush by Indian braves under French officers, and many were killed. The Virginia troops, familiar with such warfare, at once broke ranks, and from behind rocks and trees picked off the enemy; but the gen. insisted on his regulars marching and firing in platoons in proper military order. His men were demoralized, and many (50 at one volley, it is said) of their colonial auxiliaries were killed by their aimless firing. B. after showing the greatest bravery, received a wound which proved fatal 4 days later; and 65 out of 85 officers were wounded or killed. The retreat was conducted by the young Col. George Washington.

BRAD'DON, MARY ELIZABETH: see MAXWELL, MARY ELIZABETH (BRADDON).

BRADFORD, *brad'ford:* town in Esssex co., Mass., on the s. side of the Merrimac river, 18 m. from the sea. Being opposite Haverhill, and connected with it by a bridge, it naturally forms with that flourishing place one consolidated centre of population and trade, both having the same railroad and steamboat connections. B. enjoys the advantages of an old and popular academy for young ladies, whose educational facilities are of a high grade. Manufacture of shoes is the leading business.

BRADFORD: city, McKean co., Penn., 63 m. s.e. of Dunkirk, 23 m. s.w. of Olean, N. Y., on the Buffalo, Roch-

DEFEAT AND DEATH OF GEN. BRADDOCK.

ester and Pittsburg, the Pennsylvania, Erie, and several other railroads. It is situated at an altitude of 1,427 ft. in the northern part of the state, in an extensive oil and natural gas region, and is one of the largest oil-producing cities in Pennsylvania. The natural gas supplies the city with fuel and light. The industrial establishments include numerous refineries, manufactures of oil-well supplies, tanks, boilers, tools, sucker rods, air compressors, torpedoes, nitro-glycerine, besides saw-mills, manufactures of hardwood rims, motor cycles, chemicals, bricks and tiles. The city has electric street railroads, and electric lighting, municipal waterworks, fine schools, school and public libraries, city hospital, churches, an opera house, and national and state banks. B. was founded in 1823 and received a civic charter in 1879. Pop. (1890) 10,516; (1900) 15,029; (1910) 14,544.

BRAD'FORD: important manufacturing town in West Riding, Yorkshire, Eng., on a tributary of the Aire, at the meeting of three vales, 8 m. w. of Leeds. A branch canal connects B. with the Liverpool and Leeds canal. B. is the chief seat in England of the spinning and weaving of worsted yarn, and the great mart for the long wools used in worsted and alpaca fabrics. Cottons also are manufactured. There are more than 300 mills, employing 50,000 persons. Notwithstanding the large population, and the nature of their employment, the annual rate of mortality had fallen a few years since from 30 to 24 per thousand. The Saltaire alpaca and mohair mills, on the Aire, 3 m. from B., covering more than 6 acres, erected by Sir Titus Salt, Bart., were the most splendid manufacturing concern in England; but of late this industry has declined. Here is also the largest silk-mill in England. Coal and iron mines are near Bradford. There are over 30 churches belonging to the establishment in the borough, and 80 Dissenting and Rom. Cath. churches. B. has many excellent charities. In the civil wars, the people of B. took the parliament side, and twice defeated the royalists, but were afterward defeated by the Earl of Newcastle. In 1825, a strike for increased wages, in which 20,000 persons were concerned, lasted six months. The Baptists, Congregationalists, and Wesleyans have colleges near Bradford. At Fulneck, 3 m. e. of B., is a Moravian settlement, founded 1748. B. has a spacious and elegant public hall, fine educational establishments, including a technical college, extensive recreation grounds, and many benevolent institutions. Pop. 280,000.

BRADFORD, Amory Howe, D.D.: Congregational minister: 1846, Apr. 14————; b. Granby, Oswego co., N. Y.; son of a Congl. minister. After graduating at Hamilton College, and studying at Auburn Theol. Seminary, he graduated at Andover Theol. Seminary 1870. He became pastor 1870 of the First Congl. Church, Montclair, N. J., which under his charge has grown to be one of the great churches of the denomination. Repeated calls to various cities—including one (1893) to the pastorate of the Congl. Church in Westminster Chapel, London, one of

the great churches of London, England—were declined by him. In 1892 and '93 Dr. B. was Southworth lecturer on Congregationalism in Andover Seminary. He is pres. of the Amer. Institute of Christian Philosophy, and is one of the editors of *The Outlook*, New York. Besides many articles in reviews, he has pub. *Spirit and Life* (1888); *Old Wine: New Bottles* (1892); *Heredity and Christian Problems* (1895); *Ascent of the Soul* (1902), etc.

BRADFORD, ANDREW: 1686–1742; b. Philadelphia; son of the printer William B. (q.v.). He was the only printer in Penn. from 1712–23. 1719, Dec. 22, he began the publication of *The American Weekly Mercury*, the first newspaper printed in the Middle Colonies. He also kept a book-store and was postmaster of Philadelphia. It was this man who first employed Benjamin Franklin in that city, as a type-setter, when he was cold, bedraggled, and friendless, with less than one Dutch dollar in his pocket.

BRADFORD, GAMALIEL: revolutionary officer: 1731, Sep. 2—1807, Jan. 9; b. Duxbury, Mass.; son of Judge Gamaliel B. (1705–78), descendant of Gov. William B. (q.v.). In the old French war he served as major. In the revolutionary army he commanded the 14th Mass. regt. continentals. After the war he was in the legislature, and was appointed a judge.

BRADFORD, JOSEPH (original name WILLIAM RANDOLPH HUNTER): dramatist and journalist: 1843–66; b. near Nashville, Tenn. He was in the navy 1862–64. Resigning because of illness, he became an actor, changing his name and appearing first in Baltimore. About 1871 he turned from the stage to dramatic and other literary work. Two of his plays, *Our Bachelors*, and *One of the Finest*, had great success, and still hold the stage. His satirical verses in the Boston papers were mostly on political themes. He wrote some notable poems in a serious vein, e.g., on the deaths of Victor Hugo and Gen. Grant. His collected poems have been published.

BRADFORD, ROBERT: officer in the revolution: 1750–1823; b. Plymouth, Mass.; descendant of Gov. William B. (q.v.). His milit. service extended through the war, from Bunker Hill to Yorktown: his rank was that of major, and for his gallantry Lafayette presented him with a sword. He was one of the Ohio company that settled the town of Marietta 1788 (see PUTNAM, RUFUS). In 1789 he with others settled the town of Belpre, Ohio; and in that place he died.

BRADFORD, WILLIAM: 1588–1657; b. England, d. Mass.: second governor of Plymouth colony. As an English puritan, at Leyden, he was active in promoting the scheme of emigrating in an English colony, and was one of the pilgrims in the *Mayflower*. One of his first acts as gov. was to ratify a league with Massasoit, and to suppress a dangerous Indian conspiracy. The patent of 1629 conveys to him his 'heirs, associates, and assigns' the tract on which Plymouth plantation was situated. He was gov. for 31 years, and declined the office five years. B. pos-

sessed firmness and energy of mind, with gentleness of heart. He had also good literary culture, and wrote books. His principal literary work was a *History of Plymouth Colony* from 1602 *to* 1647. See PILGRIM FATHERS.

BRADFORD, WILLIAM: 1658–1752; b. England: printer. He was one of the Quakers brought over by William Penn, 1682. Three years after his arrival he set up a printing-press, the first one s. of New England, and published an almanac for 1686. Having sided against the authorities in the Keith quarrel, he was placed under arrest and his press confiscated. Conducting his own defense with shrewdness in the trial which followed, he escaped punishment through a disagreement of the jury. Having received an invitation to set up a press in New York he settled there, 1793, and printed the laws of the colony the same year. 1725, Oct. 16, he started the first newspaper in New York—*The New York Gazette.* Three years later he established a paper-mill at Elizabeth, N. J. B. was the only printer in New York for 30 years, and he held the office of public printer more than 50 years. He was buried in Trinity church-yard.

BRADFORD, WILLIAM: printer, and milit. officer in the revolution: 1719–1791, Sep. 25; b. New York; grandson of William B., first New York printer. He settled in Philadelphia 1742, and founded the *Pennsylvania Journal.* He interested himself in public affairs, established the London coffee house, and engaged in marine insurance. An able writer, he attached himself to the side of the colonists in their struggle against British dictation; and enlisted in the militia, rising rapidly to be major and col. He fought at Trenton, and was wounded in the battle of Princeton. His paper became, 1801, the *True American.*

BRADFORD, WILLIAM: jurist: 1755, Sep. 14—1795, Aug. 23; b. Philadelphia; son of Col. William B. He graduated at Princeton 1772, studied law, and was admitted to practice 1779. He served in the revolutionary war, and rose to the rank of lieut.col. In 1780 he was made atty.gen. of Penn.; and 1791, Aug. 22, was appointed a judge of the supreme court of the state. Pres. Washington appointed him attorney-gen. of the United States 1794, Jan. 8. He was a graceful writer of verse after the manner of Shenstone; and published 1793 *An Inquiry how far the Punishment of Death is Necessary in Pennsylvania,* which had influence in modifying the penal laws of that state.—His bro. THOMAS B. (1745–1838, b. Philadelphia) was commissary-gen. of the Penn. division of the continental army.

BRAD'FORD, WILLIAM: marine and Arctic painter: 1827–1892, Apr. 25; b. New Bedford, Mass. He was in mercantile business from boyhood until middle life, but gave all his leisure to painting. Unsuccessful as a merchant, he took refuge in his art, and made his first impression by his fidelity and skill in painting ships and boats. Extending his experience, he sketched the coast lines and scenes of New England and the Brit. provinces

as far as Labrador, and became famous for his pictures of icebergs and Arctic scenery. He made excursions into the extreme n. Atlantic with fine results in artistic work. Among his paintings are *Fishing-boats in the Bay of Fundy; Shipwreck off Nantucket; The Coast of Labrador; Crushed by Icebergs; Sunset in the North; The Island of Grand Menan; Arctic Scene;* etc.

BRADFORD CLAY: member of the Lower Oolite: a blue unctuous clay occurring at and near Bradford, near Bath, England; remarkable for containing large numbers of a Crinoid (q.v.), (*Apiocrinites Parkinsoni*).

BRADFORD-ON-AVON: town in the county of Wilts, Eng., on both sides of the Avon, on the Kennet and Avon canal, 6 m. e.s.e. of Bath; noted for many centuries for its manufacture of fine broadcloths. Kerseymeres were first made here. Pop. 4,500.

BRADISH, *brā'dĭsh*, LUTHER: statesman: 1783, Sep. 15—1863, Aug. 30; b. Cummington, Mass. After graduating at Williams College 1804, and studying law, he travelled in Europe; on his return home was commissioned by the U. S. govt. to visit the Levant and collect information regarding its commercial relations. He sailed in the war-ship *Columbus* 1820, and on the fulfillment of his mission continued his travels in Europe and the East. He settled in Franklin co., N. Y., 1826; was member of the state assembly 1827–30 and 1835–38; lieut.gov. 1839–43; meanwhile was defeated as whig candidate for gov. Under Pres. Fillmore he was assist. U. S. treasurer in New York. At his death he was pres. of the Amer. Bible Society.

BRADLAUGH, *brăd'law*, CHARLES: social reformer: 1883, Sep. 28—1891, Jan. 30: b. London. As a boy he was thrown on his own resources and made a living as best he could; in early manhood enlisted as a soldier, but procured a discharge 1853, and was employed as a lawyer's clerk. His leisure he gave to reading and study of questions regarding religious belief, and adopting the Secularist platform, began to deliver 'Freethought' lectures everywhere and to contribute to the *National Reformer*. He was elected to parliament by Northampton 1880. On presenting himself in the house of commons he refused, as an atheist, to take the oath of allegiance. The house refused to accept him as a member. B. then declared his willingness to take the oath, but the house would not assent; he was not permitted even to 'affirm.' B. carried his quarrel before his Manchester constituents when the house had declared his seat vacant. They re-elected him, but the house again refused to admit him. B., however, persisted, was elected the fourth time, took the oath, and was admitted to his seat. In parliament he immediately won, and retained to the end, the respect of his fellow-members. For publishing *Fruits of Philosophy* he was sentenced to pay a fine and to be imprisoned 1876; but the judgment was reversed. See OATH.

BRADLEE, *brăd'lē*, NATHANIEL, American architect: b. Boston, 1829; d. 1888; began the study of architecture in 1846. He achieved marked success, having been the architect of over 500 prominent buildings in the city of Boston. In 1869 he made a national reputation by moving bodily the large brick structure known as the Hotel Pelham to the corner of Tremont and Boylston streets. The work attracted wide attention, both in this country and in Europe. He subsequently superintended the removal of the Boylston Market.

BRADLEY, *brăd'lĭ*, ARTHUR GRANVILLE, English author, son of George Granville Bradley (q.v.): b. 1850, Nov. 11. He was educated at Marlborough and Trinity College, Cambridge, and has published *History of Marlborough College* (1893); *Life of Wolfe* (1895); *Sketches from Old Virginia* (1897); *Highways and Byways of North Wales* (1898); *The Fight with France for North America* (1900); *Highways and Byways of the English Lake District* (1901); *Owen Glyndwyr* (1901); *Highways and Byways of South Wales* (1903); *Canada in the Twentieth Century* (1903); *Captain John Smith; Marshes of South Wales* (1905); etc.

BRADLEY, EDWARD (CUTHBERT BEDE), English author and clergyman: b. Kidderminster, 1827; d. Lenton, 1889, Dec. 12. He was graduated at Durham University, and was rector of Denton, Stretton, and finally Lenton from 1883 until his death. He contributed to *Punch* and other London periodicals, and published the *Adventures of Mr. Verdant Green, an Oxford Freshman* (London, 1855), a humorous picture of college life. His other works include *Mr. Verdant Green Married* and *Done For* (1856); *The White Wife*, a collection of Scottish legends (1864); *Little Mr. Bouncer and His Friend, Verdant Green* (1873-4); and several books of travel.

BRADLEY, GEORGE GRANVILLE, D.D., LL.D.: Anglican clergyman: 1821, Dec. 11—1903, Mar. 12; b. Glasbury, England. At Rugby he was a pupil of Dr. Arnold, and his tutor at Oxford was Arthur P. Stanley (afterward Dean): he graduated with high honors at Oxford 1844, and was elected to a fellowship. He was several years an asst. master at Rugby, and 1858 became head-master of Marlborough Coll.; master of University Coll., Oxford, 1870; canon in Worcester Cathedral 1881; and dean of Westminster the same year, succeeding Dean Stanley. He pub. *Recollections of Arthur Penrhyn Stanley* (1883), and was editor of memoirs and letters of him. In the dept. of biblical research he also published *The Book of Ecclesiastes* (1885), and *The Book of Job* (1887), under the general title *Westminster Abbey Lectures*. B. was author of a work on *Latin Prose Composition*, which has large circulation in the United States and England. His degree LL.D. was conferred by the Univ. of St. Andrews 1873, his degree in theol. by the Univ. of Oxford 1881.—His daughter Margaret L. (B.) Woods, wife of the pres.

of Trinity Coll., Oxford, wrote *A Village Tragedy* (1887) another daughter, Elizabeth B., *Memoirs of Lady Arabella Stuart* (1889).

BRADLEY, Henry, English scholar and lexicographer: b. Manchester, England, 1845, Dec. 3. He has twice been president of the Philological Society and has been joint editor of the 'Oxford English Dictionary' from 1889. He has published *The Story of the Goths* (1888); *The Making of English* (1904); contributed important articles to the 'Dictionary of National Biography'; etc., and edited the E, F, G, L and M portions of the 'Oxford Dictionary.'

BRADLEY, James, d.d.: 1692, Mar.–1762: July 13; b. Sherbourne, Gloucestershire, Eng.: astronomer and discoverer. Being intended for the priesthood, he graduated at Oxford, and obtained successively the livings of Bridslow and of Welfrie, Pembrokeshire. Applying himself to mathematics and astronomy, he made such advancement as soon won the friendship of the leading mathematicians of his time, notably Isaac Newton, and caused his election as a member of the Royal Soc. About this time, 1721, he became, in his 29th year, Savilian prof. of astronomy at Oxford, resigned his livings, and gave himself to science. In 1727 he published his theory of the aberration of the fixed stars, with the important discovery of the Aberration of Light (q.v.), to which, it is related, he was led somewhat by accident, as Sir Isaac Newton was to the theory of gravitation. Three years afterward B. became lecturer on astronomy and physics at the Oxford Museum. His next discovery was that the inclination of the earth's axis to the ecliptic is not constant, a fact including the explanation of the precession of the equinoxes and the nutation of the earth's axis. Latterly B. became Regius prof. of astronomy at Greenwich, where his observations further enriched science. For his services to navigation he received from the crown a pension of £250 a year.

BRADLEY, John Edwin, American educator: b. Lee, Mass. He was graduated from Williams College in 1865, and was successively principal of high schools in Pittsfield, Mass., 1865–8; Albany, N. Y., 1868–86. He was superintendent of schools at Minneapolis 1886–92, and president of Illinois College 1892–1900. He is the author of *Science and Industry; School Incentives; Healthfulness of Intellectual Pursuits; Work and Play; Talks With Students.*

BRADLEY, Joseph P., ll.d.: 1813, Mar. 14—1892, Jan. 22; b. Berne, N. Y.: jurist. He graduated at Rutgers College 1836; was admitted to the bar 1839; settled in Newark, N. J., and practiced there for 30 years; was engaged in many important cases in the courts of N. J. and of the United States for that district; was mathematician of the Mutual Benefit Life Insurance Co. 1851–63, and director and counsel in several large corporations for many years; republican presidential elector 1868; and was

appointed by Pres. Grant an assoc. justice of the U. S. supreme court 1870, Mar. 21. He received his degree from Lafayette College 1859; was chosen by four of his associates on the supreme court bench to be the fifth member of the electoral commission 1877, and concurred in the judgment of the republican members of the commission and supplemented his votes by remarkably comprehensive arguments. He was widely known for his mathematical, historical, and genealogical researches.

BRADOON: see BRIDOON.

BRADSHAW, JOHN: 1602–1659, Nov. 22; of a good family in Cheshire, England: regicide. He studied law at Gray's Inn. Called to the bar, he gained a good practice by his ability and learning especially as a chamber counsel. In 1646, Oct., he was appointed a commissioner of the Great Seal, and in 1647, Feb., chief-justice of Chester. In 1648, Oct., he received the degree of sergeant, and in the following Jan., was elected pres. of the high court of justice for the trial of King Charles I. As the reward of his services on that solemn occasion, he was made pres. of the council of state and chancellor of the duchy of Lancaster, beside the grant of estates worth £4,000 per annum, the deanery house of Westminster for a residence, and £5,000 to furnish it. B., however, refused submission to the Protector. He was an able lawyer, but not an able politician. His mind was rigid rather than broad, and, in consequence, he was unable (like so many others of the stern fanatical republicans of his time) to see or comprehend the necessity for a great iron rule like Cromwell's. He even engaged in some Fifth Monarchy and other plots against Cromwell, but his respectable character and past services saved him from molestation. He was deprived, however, of his office as chief-justice of Chester. After Oliver's death, he was lord president of the council of state, and a commissioner of the Great Seal under Richard. His last public act was to protest against the violent seizure of Speaker Lenthall by the army. He died 1659, Nov. 22. His body was buried with pomp in Westminster Abbey, but was afterward exhumed and hung on a gibbet, with those of Cromwell and Ireton.

BRADSHAW'S RAILWAY GUIDE: pioneer and still the type of the extensive class of publications for giving all necessary information in regard to traveling. It derives its name from George Bradshaw (1801–53) originally a map-engraver in Manchester, England, who in 1839 issued an occasional work, called in 1840 the *Railway Companion* corrected by a broad sheet, styled *Monthly Time Tables*. The guide is now published on the first of each month, and contains the latest time-tables of railway and steamboat companies, besides other useful information for travelers. The idea has been still further developed in the descriptive hand books of Murray, Baedeker, and others.

BRADSTREET, *brăd'strēt*, ANNE (DUDLEY): earliest American poetess: 1612–72; b. Northampton, Eng.; dau. of Thomas Dudley (gov. of the Mass. colony). She married (1628) Gov. Simon Bradstreet (q.v.), and emigrated with him to New England 1630. She was the mother of eight children. Of her poems on a variety of subjects, *Contemplations* is considered the best. They are quaint and curious in style and show much learning. The London publisher of her poems styled her 'The Tenth Muse lately sprung up in America.' John Harvard Ellis, of Charlestown, Mass., reprinted her complete works 1868.

BRADSTREET, JOHN, English soldier in America: b. 1711; d. New York, 1774, Oct. 21. He was, in 1746, lieutenant-governor of St. Johns, Newfoundland. In 1756, when it was considered highly important to keep open the communication with Fort Oswego, on Lake Ontario, he was placed at the head of 40 companies of boatmen, raised for the purpose of supplying it with stores from Schenectady. On his return, 1756, July 3, with 300 of his force he was attacked from an ambuscade, on the Onondaga River, but repulsed and routed the enemy with great loss. In 1758 he commanded a force of 3,000 men in the expedition against Fort Frontenac, which was surrendered August 27, with all its military stores, provisions, and merchandise, on the second day after he commenced the attack. In 1764 he advanced with a considerable party toward the Indian country, and made a treaty of peace with the various tribes at Presque Isle. He was appointed major-general in 1772.

BRADSTREET, SIMON: 1603–97: gov. of Mass. colony. He was born in England, where he became steward to the Countess of Warwick, and married the poetess, Anne Dudley. He emigrated to Massachusetts with the early settlers, arriving at Salem 1630. He held the various offices of assistant judge, agent, secretary, and commissioner of the united colonies. In 1662 he went to England to congratulate the king on his restoration. He was assistant gov. (1630–73), deputy gov. (1673–79), gov. 7 years from 1679 until the charter was recalled, and again 1689, May—1692, May, when, at the arrival of the new charter, he became first councilor.

BRADWARDINE, *brăd'wėr-dĭn*, or BREDWARDINE, THOMAS (DOCTOR PROFUNDUS), English scholar: b Hartfield, Sussex, about 1290; d. 1349. He was distinguished for his varied learning, and more particularly for his treatise, *De Causa Dei Contra Pelagium*, an extensive work against the Pelagian heresy, for centuries a standard authority. He was chaplain and confessor to Edward III., whom he accompanied to France, being present at Cressy and the capture of Calais. Being appointed archbishop of Canterbury, he hastened to England, but died of the black death on reaching London. Other works by him are: *'De Geometria Speculativa'*; *De Proportionibus; De Quadratura Circuli; De Arithmetica Practica.*

BRADWARDINE, Baron, a character in Scott's novel of *Waverley*. He is represented as a rather opinionated retired soldier living at his seat of Tully Vedlan.

BRADY, *brā'dĭ*, Anthony Nicholas, American capitalist: b. of Irish parentage, Lille, France, 1843, Aug. 22. He came as an infant with his parents to the United States, and at the age of 13 began to make his own way in life. After engaging successfully in the tea business in Albany, and in that of granite quarrying, he became financially interested in gas companies, railway companies and the like, successfully developing the street railway system of New York and amassing a fortune of many millions. He has also been connected with oil and electric lighting interests.

BRADY, Cyrus Townsend, American Episcopal clergyman and author: b. Allegheny, Pa., 1861, Dec. 20. He graduated from the United States Naval Academy, 1883, but resigned, studied theology under Bishop Worthington of Nebraska, and was ordained in 1890. For five years he served as a missionary in Colorado, Missouri, and Kansas; and archdeacon of Pennsylvania, 1895–9, and rector at Overbrook, Philadelphia, from 1899 until his resignation to devote himself exclusively to writing, in which he has attained popularity as a writer of stories and novels of adventure, romance, and history. He has written *For Love of Country* (1898); *For the Freedom of the Sea* (1899); *Stephen Decatur* (1900); *Recollections of a Missionary in the Great West* (1900); *American Fights and Fighters* (1900); *Commodore Paul Jones* (1900); *When Blades are Out and Love's Afield* (1901); *Under Tops'ls and Tents* (1901); *An Apostle of the Plains* (1901); *Colonial Fights and Fighters* (1901); *Under the Ban of the Red Beard* (1901); *Border Fights and Fighters* (1902); *Hohenzollern* (1902); *In the Wasp's Nest* (1902); *Quiberon Touch* (1901–2); *Woven With the Ship* (1902); *The Bishop* (1903); *The Southerners* (1903); *The Grip of Honor* (1899); *Reuben James* (1900); *Sir Henry Morgan, Buccaneer* (1903); *The Doctor of Philosophy* (1903); *The War with Mexico* (1903); *The Corner in Coffee* (1904); *The Records* (1904); *A Little Traitor to the South* (1904); *A Midshipman in the Pacific* (1904); *Indian Fights and Fighters* (1904); *The Conquest of the Southwest* (1905); *The Two Captains* (1905); etc.

BRADY, Henry Bowman, English paleontologist: b. Gateshead, England, 1835; d. 1890. He was prominent as a manufacturing pharmacist and his success in business enabled him to devote much time to scientific research, becoming in time the highest English authority regarding foraminifera. He was the author of several monographs on Mesozoic, Cenozoic and other foraminifera, and of the more important works: *Report on the Foraminifera Dredged by H. M. S. Challenger, During the Years* 1873–6, and *Scientific Results of the Challenger Voyage*, Vol. IX. (1888).

BRADY, Hugh: milit. officer: 1768, July—1851, Apr. 15; b. Northumberland co., Penn. Entering the army 1792, he was promoted lieut. 1794; capt. 1799; col. 1812, leading the 22d infantry with great bravery in the battle of Chippewa. He was wounded at Lundy's Lane and Niagara. He was brevetted brig.gen. 1822, and placed at Detroit in command of a dept. 1835; and for long and faithful service was brevetted maj.gen. 1848. D. in Detroit.

BRADY, James Topham: legal advocate: 1815, Apr. 9—1869, Feb. 9; b. New York. He studied law under his father, Thomas S. B., jurist, and began practice, New York 1836. He early gained great reputation for his successful defense in different criminal cases, likewise for his skillful conduct of civil causes. As advocate in an unpromising criminal case he was unsurpassed for clearness of statement, for tact and courtesy in cross-examination, and for impressive eloquence in appeal. Before the war he was a pro-slavery and state-rights democrat, and candidate for gov. of N. Y. 1860; but warmly supported the war measures of Lincoln's administration. D. New York.

BRADY, John, Irish-American ecclesiastic: b. County Cavan, Ireland, 1842. He prepared for the priesthood at All Hallows College in Ireland, was assistant priest in Newburyport, Mass., 1864–8, and since 1868 has been pastor of St. Joseph's Church at Amesbury, Mass. In 1891 he was consecrated auxiliary bishop of Boston and titular bishop of Alabanda, but still continues his parochial work.

BRADY, *brā'dĭ*, Nicholas, d.d.: 1659–1726; b. Bandon, Ireland: divine and author. He graduated at the Univ. of Dublin, and became chaplain to William III. and Mary. He favored the revolution, but during the disturbances of 1690, by his personal influence, saved his native town three times from being burned, though James II. had ordered its destruction. He wrote *A Translation of Virgil's Æneid*, and in conjunction with Nahum Tate, made a metrical version of *The Psalms of David*, long in common use.

BRADY, William Maziere, Irish theologian: b. Dublin, 1825. He was for a long period a clergyman in the Established Church of Ireland, but was prominent in the agitation leading to its disestablishment in 1869, and lost several of his preferments by that event. In 1873 he entered the Roman Catholic Church. He has published *The Episcopal Succession in England, Ireland, and Scotland*, 1400–1875 (1876–7); *Annals of the Catholic Hierarchy in England and Scotland* (1883); *Anglo-Roman Papers* (1890).

BRADYPODIDÆ, n. plu. *brăd'ĭ-pŏd'ĭ-dē* [Gr. *bradus*, slow; *podes*, feet]: the family of edentata comprising the sloths. Brad'ypus, n. *-pŭs*, the sloth (q.v.).

BRAE, n. *brā*. Braes, n. plu. *brāz* [Gael. *bruach*, a bank,

a steep ascent: OE. *bray* or *braye*, a rising ground]: in *Scot.*, a hillside; the face of a hill; a rising ground.

BRAEKELEER, *brä'kĕ-lār*, FERDINANDUS DÉ, Belgian artist: b. Antwerp, 1792; d. 1883. He was a member of the Antwerp Academy and a director of the Antwerp Museum, and as an instructor was especially successful. Among his works are *Tobit Burying a Jew by Night* (1817); *The Baker; Bombardment of Antwerp in* 1830; *Happy Family; Unhappy Family.*

BRAEMAR, *brā-mâr'* (including the united parishes of Braemar and Crathie): extensive Highland dist. occupying the s.w. corner of Aberdeenshire, in the heart of the Grampian Mountains, and intersected by the upper part of the Dee and its tributaries. The chief mountains are Ben Macdhui (q.v); Cairntoul, 4,220 ft.; Braeriach, 4,225; Ben-a-Buird, 3,851; and Ben Avon, 3,826, on the n.: and Lochnagar (q.v.) on the s. Patches of snow lie on these mountains all the year round. The rocks of B. are granite, gneiss, and quartz, with beds of primary limestone, and masses of serpentine, trap, and porphyry. Most of the district is uncultivated, and consists of healthy tracts, while about a twentieth of the surface is in wood. The natural woods are birch, alder, poplar, and rowan, and the planted chiefly larch and Scotch fir. The fir-timber of the ancient Caledonian forest of Mar, now nearly all cut down, is, for size and quality, the best in the kingdom. Red-deer, roes, grouse, ptarmigan, and alpine hares abound. Many rare alpine plants are found on the mountains and in the glens. Black-faced sheep and small black-horned cattle are reared. Here the Earl of Mar first raised his standard for the Pretender, 1715, Sep. The district is intersected by the great military road from Blairgowrie to Fort George, made by General Wade. In the e. part of the district is Balmoral (q.v.); and near its centre is the small village of Castleton of B., a favorite resort for travellers, sportsmen, and lovers of grand scenery. Pop. about 2,000, many of whom still speak Gaelic.

BRAG, n. *brăg* [F. *braguer*, to flaunt: W. *bragio*, to brag; *brac*, boastful: Icel. *braka;* Dan. *brag*, a crack, a crash: Gael. *bragh*, a burst or explosion; *breug*, a falsehood—*lit.*, to thrust one's self on the notice of others by making a noise]: a boast; proud expressions; thing boasted: V. to boast; to speak highly of one's self in regard to anything. BRAG'GING, imp: N. the act or habit of a bragger. BRAGGED, pp. *brăgd.* BRAG'GER, n. one who. BRAGGART, a. *brăg'gĕrt*, boastful: N. a vain, boasting person. BRAG'GARDISM, n. *-dĭzm*, and BRAG'GARTISM, n. *-tĭzm*, boastfulness; vain ostentation. BRAGGADOCIO, n. *brăg-gă-dō'-shĭ-ō* [It.]: a puffing, boasting fellow; a swaggerer.

BRAGA, *brâ'gâ*, THEOPHILO, Portuguese philologist and critic; b. San Miguel, Azores, 1843, Feb. 24. He was educated at the university of Coimbra, and became professor of literature in the Curso Superior de Letras in

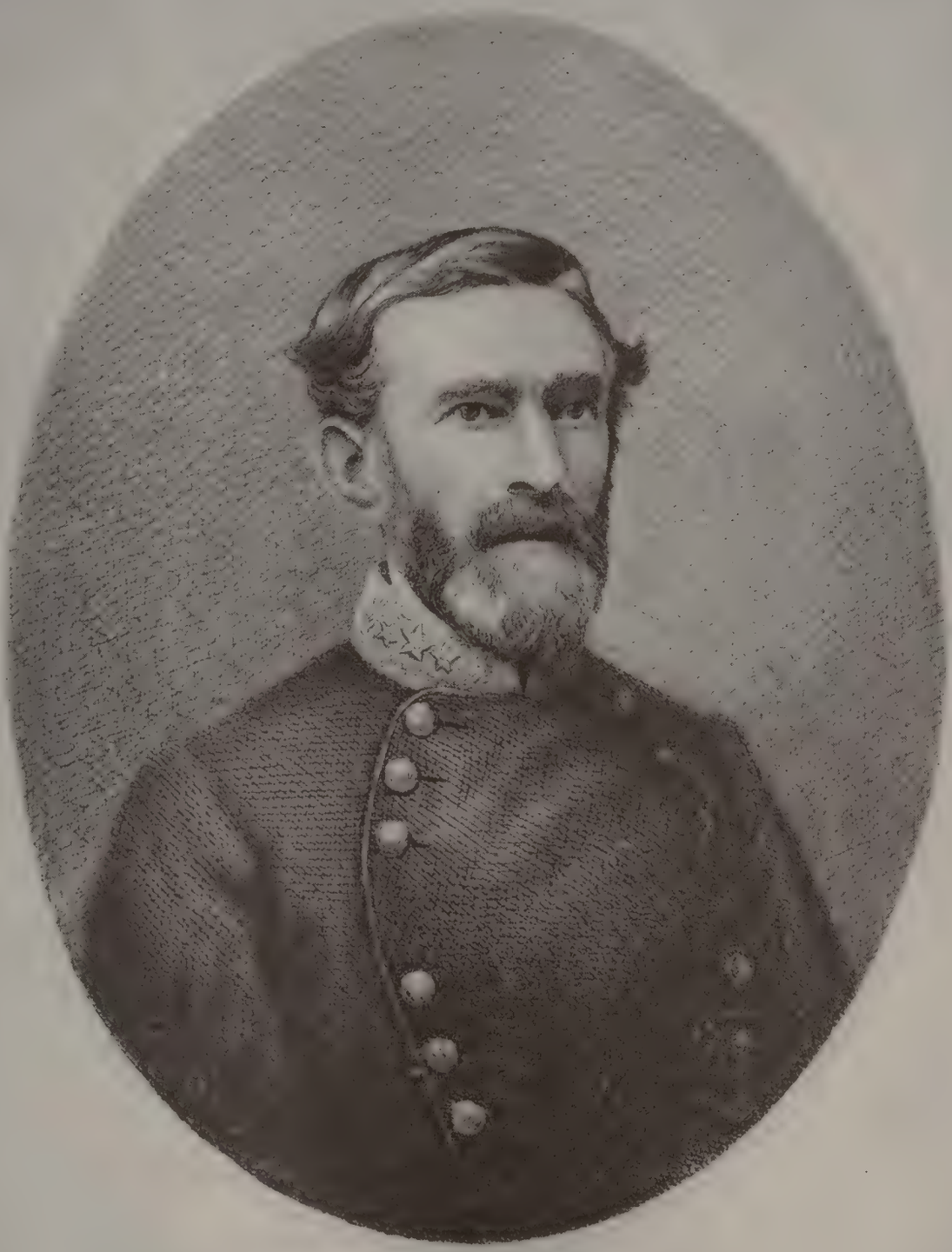
Lisbon. He is a very voluminous writer and takes important rank as a historian of the literature of the Iberian peninsula. He is also noted as an exponent of the Comtian philosophy. In addition to other literary activity, he has published several volumes of poems. Among these may be mentioned: *Stella Matutina* (1863); *Tempestades Sonoras* (1864); *Torrentes* (1868), and a collection entitled *Alma Portugueza* (1893). Of his other works may be noted: *Historia da Litteratura Portugueza* (1870–81); *Manual da Litteratura Portugueza* (1875); *Parnaso Portuguez Moderno* (1877); a volume on Camöens (1880); *Tracos Geraes de Philosophia Positiva* (1877); *Cantos Tradicionaes do Povo Portuguez* (1883); *Systema de Sociologia* (1884); *Historia da Universidade de Coimbra* (1892).

BRAGA, city of Portugal, cap. of the province of Minho; on an eminence between the rivers Cavado and D'Este, about 35 m. n.e. of Oporto. The neighborhood is charming, especially along the banks of the river Cavado. B. is surrounded by old walls, flanked with towers, and defended by a castle. It is the residence of the primate of Portugal, who has a palace here. It has also a fine Gothic cathedral, several spacious squares; and manufactures of linen, hats, cutlery, firearms, jewelry, etc. It is a very ancient place, being supposed to owe its origin to the Carthaginians. In the time of the Romans, the city was named *Bracara Augusta*, and the ruins of a temple, an amphitheatre, and an aqueduct, belonging to that era, still remain. Not far from B. stands the celebrated *Sanctuario do bom Jesus do Monte*, still a place of pilgrimage. After the Suevi had taken Lusitania from the Romans, B. was made the metropolis; and here, at a council held 563, the Suevi, with their king, renounced the errors of Arianism, and submitted to the teaching of the Rom. Cath. Church. After the fall of the Suevian and West-Gothic kingdom, B. fell into the hands of the Arabs, from whom it was taken by the forces of Old Castile, 1040. After the establishment of the Portuguese dynasty it was annexed to the crown of Portugal. Pop. about 20,000.

BRAGANÇA, *brâ-gân'sâ:* seaport of Brazil, abt. a degree s. of the equator, at the mouth of the Caite, which enters the Atlantic about 100 m. to the e.s.e of the Amazon. Pop. abt. 6,000.

BRAGANÇA: inland city of Brazil, 50 m. n.e. of San Paulo, and about 200 w. of Rio Janeiro; about a degree n. of the tropic of Capricorn. Pop. abt. 10,000.

BRAGANZA, or BRAGANÇA, city of Portugal, cap. of the province Tras-os Montes, in a pleasant and fertile district, on the river Fervença, affluent of the Sabor. The city is surrounded with walls; has two castles, partly in ruins, of which one was the ancestral seat of the Dukes of B.; and has manufactures of silk and velvet. This city gives its name to the House of Braganza, the present



Braxton Bragg.

ruling dynasty in Portugal (see PORTUGAL). John, eighth Duke of Braganza having ascended the throne as John IV., when the Portuguese liberated themselves from the Spanish yoke, 1640. Pop. of B. 5,500.

BRAGG, *brăg*, BRAXTON: 1817, March 22—1876, Sep. 27; b. Warren Co., N. C.: general. He was educated at West Point, graduating, 1837, with Sedgwick, Hooker, Early, and Pemberton. He served with distinction in the Seminole and Mexican wars, and was promoted for bravery at Monterey and Buena Vista. Resigning his commission, 1856, he retired to a plantation in Louisiana, where he held the office of commissioner of public works for several years. When the rebellion opened he joined the Confederate army. After the battle of Shiloh he was promoted general in place of A. J. Johnston, killed. At Perryville he was defeated, but made a successful retreat. He was then removed from command, but was soon afterward restored. At Murfreesboro he was defeated by Rosecrans, and at Chattanooga, by Grant. B. was a favorite of Jefferson Davis, and for a time acted as his chief military adviser. After the war he was appointed chief engineer of Alabama and superintended the improvements in Mobile Bay.

BRAGG, EDWARD STUYVESANT, American legislator: b. Unadilla, N. Y., 1827, Feb. 20. He was educated at Geneva (now Hobart) College, and admitted to the bar in New York in 1848. He removed to Fond du Lac, Wis., and was admitted to the Wisconsin bar in 1850, to that of Illinois in 1869, and to that of the United States supreme court in 1877. He served in the Union army during the Civil War, and won his way to the rank of brigadier-general. He was a member of the Union convention at Philadelphia in 1866; representative in Congress in 1877–85; and a delegate to the Democratic National Conventions of 1872, 1884, 1892, and 1896. In the convention of 1884 he seconded the renomination of Grover Cleveland, when he uttered the memorable phrase, 'We love him for the enemies he has made.' In 1888 he was appointed minister to Mexico; from 1902, May 15—Sept. 15, was the first United States counsel-general in Havana under the new republic of Cuba and since 1902, Sept. 15, has been counsel-general at Hong Kong.

BRAGGET, n. *brăg'gĕt* [W. *brag*, malt; *bragod*, bragget: Gael. *bracha*, malt; *brachada*, fermentation]: sweet-wort; a liquor made from ale-wort and mead.

BRAGI, *brā'ge:* in the Norse or Scandinavian mythology; son of Odin and Frigga; the god of poetry and eloquence. Upon his tongue were engraved the runes of speech, so that it was impossible for him to utter a sentence that did not contain wisdom. According to the older of poetic Edda, he was the most perfect of all scalds or poets, and the inventor of poetry, which is designated by a kindred word, *bragr*. Unlike Apollo, who, in the Greek mythology, is represented as enjoying

eternal youth, B. was supposed to be an old man with a long, flowing beard; but his brow was always mild and unwrinkled. B.'s wife was Idunna. Together with Hermothr or Hermode, he received and welcomed all those heroes who had fallen in battle, on their arrival in Valhalla. On festive occasions, as well as on the burial of a king, a goblet, called Bragafull (B.'s goblet), was presented, before which each man rose up, made a solemn vow, and emptied it. Several German periodicals and works, intended to cherish a national spirit, have taken the name of Bragi.

BRAHAM, *brā'ham*, JOHN: 1777–1856, Feb. 5; b. London, of Jewish origin: tenor singer. He had an unusually long professional career, having sung on the stage at the age of ten, and continued to make occasional appearances at concerts until within a few years of his death. About the close of the 18th c. he visited France and Italy for improvement; returning to London, his triumph was transcendent, and from that time, for half a century, he held the reputation of one of the greatest tenor-singers in Europe. It was as a concert-singer that he excelled, and his great declamatory power and florid execution made his singing of the national songs wonderfully effective.

BRAHÉ, *brā* or *brâ*, Dan. *brâ'ĕh*, TYCHO: 1546–1601, Oct. 13; b. at Knudstrup, Sweden, then a province of Denmark; descended from a noble family, originally Swedish. His is one of the most distinguished names in astronomical science. He was sent at the age of 13, to the Univ. of Copenhagen, where he had not been more than a year, when an eclipse of the sun turned his attention to astronomy. His uncle, who destined him for the law, furnished him with a tutor, and sent him to Leipsic, 1562, but B., who cared nothing for that study, devoted just so much time to it as would save appearances, and while his tutor slept, busied himself nightly with the stars. By these surreptitious observations of the heavens, and with no other mechanical contrivances than a globe about the size of an orange, and a pair of rude compasses, he succeeded, as early as 1563, in detecting grave errors in the Alphonsine and Prutenic tables, and set about their correction. The death of an uncle, who left him an estate, recalled him to his native place 1565; but he very soon became disgusted with the ignorance and arrogance of those moving in the same sphere with himself, and went back to Germany. At Wittenberg, where he resided for a short time, he lost part of his nose in a duel with a Danish gentleman; but for the lost organ he ingeniously contrived one of gold, that fitted so admirably, and was so naturally colored, that few could have detected that it was artificial. After a couple of years spent in Augsburg, he returned home, where, 1572, he discovered a new and brilliant star in the constellation Cassiopeia. In 1573, he married a peasant girl, which

his fellow-noblemen thought even more undignified than being addicted to astronomy; and that they considered very degrading in a gentleman, whose only becoming qualification was, in their estimation, expertness in the use of arms. After some time spent in travel, B. received from his sovereign, Frederic II., the offer of the island of Hven or Hoëne, in the Sound, as the site for an observatory, the king also offering to defray the cost of erection, and of the necessary astronomical instruments, as well as to provide him with a suitable salary. B. accepted the generous proposal, and in 1576 the foundation-stone of the castle of Uraniberg ('city of the heavens') was laid. Here, for 20 years, B. prosecuted his observations with the most unwearied industry—with a zeal, in fact, sufficient to create a new epoch—one of the three great epochs indeed—in astronomy as a science of observation. See ASTRONOMY. The scientific greatness of B. was no protection against the petty prejudices of the nobles, who could not bear to see honor heaped on one who, according to their notions, had disgraced their order, nor against the meaner jealousies of physicians, who were annoyed at his dispensing medicine gratis to the poor. So long as his munificent patron, Frederic II., lived, B.'s position was all that he could have desired, but on his death, 1588, it was greatly changed. For some years under Christian IV., B. was barely tolerated; but in 1597, his persecution had grown so unbearable, that he left the country altogether, having been the year before deprived of his observatory and emoluments. After residing a short time at Rostock and at Wandsbeck near Hamburg, he accepted an invitation of the Emperor Rudolf II.—who conferred on him a pension of 3,000 ducats—to Benatek, a few miles from Prague, where a new Uraniberg was to have been erected for him; but he died at Prague. At Benatek he had Kepler as his assistant, and to the advice of B. that celebrated astronomer owed much. The scientific publications of B. are numerous.

BRAHEA, n. *brā-hē'ă* [unascertained]: a genus of fan-leaved palms, having spiny leaf-stalks, and hermaphrodite flowers, ord. *Palmæ; B. fĭlămentōsa*, a species having palmatified leaves and whitish filaments.

BRAHILOV, *brâ-hē-lov'*, or IBRÄIL, *ē-brâ-ēl'*, or IBRAILA, *ē-brâ-ē'lâ:* free port of the kingdom of Roumania, on the left bank of the Danube, about 99 m. from its mouth; chief shipping port of Roumania, whence large quantities of corn and other products are exported. The sturgeon fisheries on the Danube are a source of considerable profit to B. A railway from Galatz to B., thence to Bucharest, was completed 1873. During the war of 1854–56, B. was occupied by Russian troops. Pop. 50,000.

BRAHMA, n. *brâ'mă* [Sks. *brahman*, a prayer, a brahman]: the universal spirit: also, the chief god of the Hindu pantheon. BRAHMANIC, a. *brâ-măn'ĭk*, relating to the Brahmans. BRAHMAN, n. *brâ'măn*, also BRAHMIN, n.

brâ′mĭn, a Hindu of the highest or priestly caste—the highest caste in the Hindu system (see CASTE). BRAH′MINISM, n. *-ĭzm*, the religion of the Brahmins. BRAHMIN′ICAL, a. *-ĭ-kăl*, relating to the office or character of a Brahmin. BRAHMO, n. *brâ′mô*, a theistic Hindu who has renounced idolatry, and become a member of the *Somaj* or congregation of reformers. BRAHMO-BRAHMISM, *-brâ′mĭzm*, the creed of the Hindu reformers. BRAHMIC, a. *brâ′mĭk*, pertaining to. BRAHMO SOMAJ, *so-măj′*, the congregation or church of the Hindu theists.

BRAHMA, in the religion and philosophy of the Hindus: a word having two related meanings. The crude or undeclined form is *brahman*, the etymological signification of which is doubtful; when declined as a neuter noun, it has the nominative Brahmă (with the final syllable short); as a masculine, it is Brahmā (with the *a* long).

BRAHMĂ (neuter) designates the universal Spirit, the ground and cause of all existence; not, however, conceived as an individual personal deity to be worshipped, but as only an object of contemplation. It is spoken of as 'that which is invisible, unseizable, without origin, without either color, eye, or ear, eternal, manifold (in creation), all-pervading, undecaying—the wise behold it as the cause of created beings.' The human soul is a portion of this universal Spirit, and a man can be free from transmigration, and be reunited to Brahmă, only by getting a correct notion of it and of the soul.

BRAHMĀ (masculine) is one of the three chief gods of the Hindu pantheon, and is specially associated with the function of creation. See TRIMURTI. Yet he himself is a creation of or emanation from Brahmă, the First Cause. The origin of Brahmā, and the way in which he created heaven and earth, is thus narrated by Manu:

'This universe was enveloped in darkness, unperceived, undistinguishable, undiscoverable, unknowable, as it were entirely sunk in sleep. Then the irresistible self-existent Lord, undiscerned, causing this universe with the five elements, and all other things, to become discernible, was manifested, dispelling the gloom. He who is beyond the cognizance of the senses, subtile, undiscernible, himself shone forth. He, desiring, seeking to produce various creatures from his own body, first created the waters, and deposited in them a seed. This [seed] became a golden egg, resplendent as the sun, in which he himself was born as Brahmā, the progenitor of all the worlds. Being formed by that First Cause, undiscernible, eternal, which is both existent and non-existent, that Male (parusha) is known in the world as Brahmā. That lord having continued a year in the egg, divided it into two parts by his mere thought. With these two shells he formed the heavens and the earth; and in the middle he placed the sky, the eight regions, and the eternal abode of the waters.'

In later times at least, B. has had few special worshippers; the only spot where he is periodically adored being

at Pushkara in Râjputana. He sometimes receives a kind of secondary homage with other deities. B. is represented with four heads. See INDIA (*Religion*): TRIMURTI: VISHNU. SIVA: VEDÂNTA.

BRAHMANBERIA, *brâ-mân-bĕr'i-â:* town of India in the presidency of Bengal, division of Chittagong. It has sea and railway communication with Calcutta, and is an active trading centre. Pop. 18,000.

BRAHMAPUTRA, *brâ-ma-pô'tra:* river which rises in Tibet, and, after partially mingling with the Ganges, flows into the Bay of Bengal by three mouths. It is formed by the junction, in Assam, of two main branches —the Brahmaputra, from the n.e., and the Sanpoo, from the n.w.; the entire length exceeds 900 m. from one source, and 1,700 from the other. The B. proper rises about lat. 28° 30′ n., long. 97° 20′ e.; while the Sanpoo springs from the same swamp as the Sutlej and the Indus. About 360 m. below their confluence, the B. leaves Assam, near Goulpara, and after 60 m. more in a s.w. direction, takes a sweep round the w. extremity of the Garrow Mountains. In lat. 25° 10′ n., long. 89° 43′ e., it throws off the Konaie, and after a course of 180 m. is named the Meghna. Ninety m. from the sea, it combines with the Ganges in cutting up their common delta into a network of inland navigation.

BRAHMIN OX: see ZEBU.

BRAHMO SOMAJ, *brâ'mo so-mâj'* (*Theistic Church*): religious and social association in India, originated by the celebrated Hindu Rajah, Rammohun Roy, 1830, under the title *Society of God.* The accession of Debendra Nath Tagore, a wealthy Calcutta Brahman, 1842, gave the movement a great impetus, which was also much aided by the spread of English education (see RAMMOHUN ROY). Its main development took place under Keshub Chunder Sen (b. 1838, d. 1884). He joined the new church, 1858, and visited Europe, 1870. It was his aim to apply the principles of the church to practical life, and under his leadership the progressive party seceded from the original church, and assumed the title 'Brahmo Somaj of India.' Their fundamental principles are that there is but one Supreme God, the object of worship; that nature and intuition are the sources whence our knowledge of God is derived; and that religion admits of progressive development. They ignore all distinctions of caste, and consider all men as God's children; they abjure all idolatrous rites, and acknowledge no sacred books or places, but value what is good and true in all religions, and recognize the necessity of public worship. In 1877, the B. had 107 branches throughout India, some following the conservative and some the progressive type. They maintained two periodicals and several schools. Since then lamentable dissensions have taken place, leading to a serious schism in the Progressive B. It had done good work in sending out missionaries; publishing a Sunday edition of

its daily newspaper (*The Indian Mirror*); encouraging fervor of devotion; singing rapturous hymns in chorus, sometimes in procession through the streets, and establishing periodical religious festivals as times for special prayer, and rejoicing. But its once excellent leader, who could endure everything else, could not endure success. People began to complain that Keshub Chunder Sen had become an autocrat, an irresponsible dictator, bishop, priest, and deacon, all in one, a kind of pope, whose will was law. Though this great reformer had himself once denounced early marriage as the curse of India, he permitted, 1878, Mar. 6, his daughter of 14 years to marry the young Mahārājā of Kuch Bahār, then but 16 years of age. After fruitless efforts to depose Sen, a new church 'The Sādhārana (or general) Brāhma-Samāj' was established on a more democratic basis than the older organization. In 1883 the number of theistic churches in India had increased to 170 or more. See SEN, KESHUB CHUNDER.

BRAHMS, *brâmz*, JOHANNES: musical composer: 1833, May 7—1897, Apr. 3; b. Hamburg. He received instruction in music first from his father, then from Eduard Marxsen, and when only 20 years old earned the highest commendation from Schumann. He was then for several years musical director at the court of Lippe-Detmold, in the meantime applying himself assiduously to study and composition. Going to Vienna 1862, he was director of the singing acad. there 1864, and then visited in succession Hamburg, Zürich, and Baden-Baden, staying for some time in each, but returning to the Austrian capital 1869, and making there his home. In Vienna he was conductor of the concerts of amateur musicians 1872–74. It was his great *German Requiem* (1868) that established B.'s reputation as a composer. His style was at first dominated by the new school of Schumann, but later he was more in sympathy with the classical school. In fact he combines in his works the different styles, and may be claimed both by the progressists and by the classicists with equal reason. Of his pieces for the pianoforte the most noteworthy are: three great sonatas (op. 1, 2, 5), a scherzo (op. 4), ballades (op. 10), a great many variations on Schumann's themes, and the *Liebeslieder* (2 series). Among his later works are *Rinaldo*, a cantata; *Schicksalslied; Triumphlied;* and *Rhapsodie* (from Goethe's *Harzreise*). His songs (*Lieder*), mostly in Schumann's style, have become very popular all over the world, as also his unrivalled settings of Hungarian dances. Of all his contemporaries B. is held to approach nearest to Beethoven in the ideal scope of his melodic inventions.

BRAID, n. *brād* [AS. *bredan*, to weave: Icel. *bregda*, to weave nets: Gael. *breïd*, a napkin]: a complicated woven texture; flat cord; trimming; a band of hair formed by plaiting three or more folds together: V. to weave or plait. BRAID'ING, imp. BRAID'ED, pp.: ADJ. edged with plaits or knots.

BRAID, n. and a. *brād* [the participle of the verb *bray:* Icel. *bragd*, the gestures by which an individual is characterized; *bregda*, to braid the hair, to weave nets, etc.]: in *OE.*, a word of difficult explanation, and of very wide and loose import; 'any kind of sudden or violent action'; a start; a snatch; fancy; caprice: ADJ. resembled; mannered.

BRAIDWOOD, *brād'wud:* town of Will co., Ill., on the Chicago and Alton railroad; 58 m. s.w. of Chicago, and about three m. s.w. from the Kankakee river. In the neighborhood are mines of bituminous coal; employ many men, and B. is a trade centre for the surrounding region. Pop. (1900) 3,279.

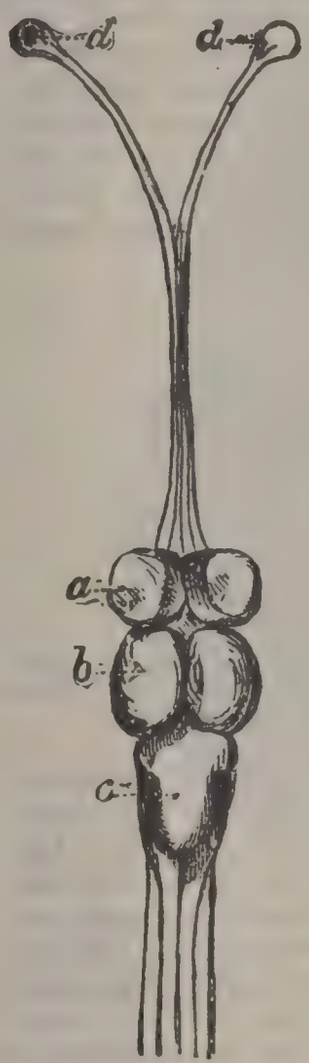


Fig. 1.—Brain of Cod.

Drawn *in situ*—shown by removing roof of skull.

a. cerebral lobes, or hemispherical ganglia; *b*. optic ganglia; *c*, cerebellum; *d*, *d*, olfactory ganglia, or bulbs, connected to brain by long prolongations or roots.

BRAILLE, n. *brāl*: a system of printing raised letters for the behoof of the blind: named for its inventor Louis Braille, of Paris.

BRAILS, n. plu. *brālz* [F. *braies*, breeches, drawers: OF. *brail*, a cincture or waistband for breeches]: a piece of leather to tie up a hawk's wing; in a *ship*, small ropes used to truss up sails; V. to tie up with a brail. BRAIL'ING, imp. BRAILED, pp. *brāld.*

BRAIN: the nervous centre in which reside consciousness and power over the voluntary movements of the body. It consists of masses of *gray* and *white* matter. When these substances are blended, the mass is termed a *ganglion*, and from it proceed prolongations of the white matter, called nerves, conductors of impressions to or from the central gray matter. The number and size of these ganglia vary with the powers of the animal. In the lowest forms of mollusk we find a single ganglion, from which proceed all the nerves of the animal; in the higher there are two ganglia, joined by a nervous cord round the gullet, and distinct from, though connected with, the ganglion which supplies nerves to the foot, and the one for the respiratory apparatus. In the common slug, we have these cephalic ganglia united so as to form one bilobed mass or B. above the esophagus.

In the ARTICULATED ANIMALS (q. v.), the B. consists of two cephalic ganglia over the esophagus; there are also two nervous cords, one on each side of the body connected with each other. In the *Cephalopoda*, as the pearly nautilus, the B., or mass of nervous matter

situated over the gullet, is a transverse *cord*-like ganglion, in the cuttle-fish (*Sepia officinalis*) it is a distinct rounded mass, supported by a rudimentary skeleton. In FISHES, instead of one supraesophageal mass or ganglion, there are several separate masses, nerves ending in their own special ganglia, i.e., where each nerve ends or begins in the B., there is a collection of vesicular neurine. In addition to these ganglia in fishes, there are parts corresponding to the cerebral lobes or hemispheres of the human brain. There is also a cerebellum.

Examining a cod's brain (fig. 1), we see three pair of neurine masses; two small and round in front, *a*, the hemispherical ganglia; two larger in the middle, the *optic* ganglia, *b;* and a little triangular appendage behind, the cerebellum, *c*. From just in front of the anterior of those three pairs of masses diverge nervous prolongations, which end in two bodies, *d*, *d*, called the *olfactory* ganglia. On lifting the appendage named cerebellum, we see on each side of the spinal cord a deposition of neurine, which represents the *auditory* ganglia of more fully developed

Fig. 2—Brain of Domestic Fowl:

a, cerebral ganglia; *b*, olfactory ganglia; *c*, cerebellum; *d*, optic ganglion of the right side, seen under cerebral ganglion. The optic nerves and eyeballs have been left in the preparation.

brains. The olfactory ganglia vary in their distance from the general mass. In REPTILIA, they are very near the cerebral hemispheres, which are small, as is also the cerebellum. But in BIRDS (fig. 2), the size of the cerebral lobe, *a*, in proportion to all the other parts is much increased, so that they overlie the different ganglia, which are not placed one in front of the other, as in fishes and reptiles, but packed one above the other. Birds show also some indications of *convolutions*. On the surface of the B. in the paroquet, Leuret describes the furrowing as distinct, though many birds have perfectly smooth hemispheres; these also are not hollow, as in fishes and reptiles; and it will be seen that the convoluting or folding of the B. substance backward and forward must allow of more being packed into the space than could be admitted by any other arrangement. The middle part of the cerebellum is very large, *c*, and divided into laminæ or leaflets; its lateral portions are much smaller than in Mammalia; the olfactory ganglia are small, *b*, and close to the cerebral hemispheres. The optic ganglia and other

nerves rising from them are very large, and the wedge-shaped portion, called *medulla-oblongata*, connecting the B. with the spinal cord, is also large. In the MAMMALIA, and in the *Monotremata*, which in some important respects resemble birds—the *Ornithorhynchus paradoxus*, for instance—are found small smooth hemispheres in a B. which to the whole body bears the proportion only of 1 to 130. Even this is greater than in the Marsupials; the kangaroo's B. is as 1 to 800.

Examining a rabbit's B., we find it to consist, apparently, of three parts—the *olfactory bulb*, the *cerebral hemispheres*, and the *cerebellum*. The cerebral hemispheres are connected by a transverse band of union, or what is technically termed

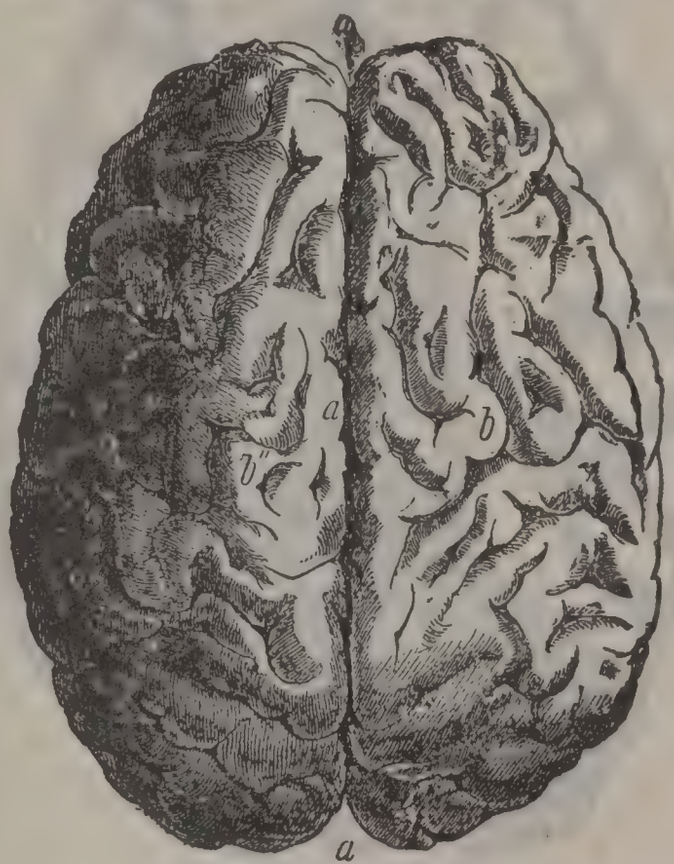


Fig. 3.—Human adult Brain:
Seen from above—membranes removed.
a, *a*, *a*, the longitudinal fissure, separating the two hemispheres, *b*,*b*.

a *commissure*. Continuing the dissection, we turn aside the hemispheres, and find they have concealed *four ganglia*, which represent the single pair of optic ganglia found in birds. There are two other bodies in front of those just alluded to—viz., the *optic thalamus*, and in front of it another (inferior) *longitudinal commissure*. This forms a communication between the anterior and posterior portions of the hemisphere, on the same side. Two little white lines, running from the back of the thalami, join a little body called the *pineal gland*. It will be observed that the hemispheres lie over these structures like a cap; the space between the two, on each side, is termed the *lateral ventricle*.

BRAIN.

We come now to consider the most complicated B., the human encephalic mass of ganglia (figs. 3, 4, 5), including with it the *medulla oblongata*, the link which unites the B. to the spinal cord. First viewing the B. from its upper surface (fig. 3), we see that it is divided by the longitudinal fissure into two equal halves or hemispheres, broader behind than in front. They are irregularly marked by convolutions, *b*, and a smooth appearance is given to the whole surface by the glistening arachnoid membrane (q.v.) On

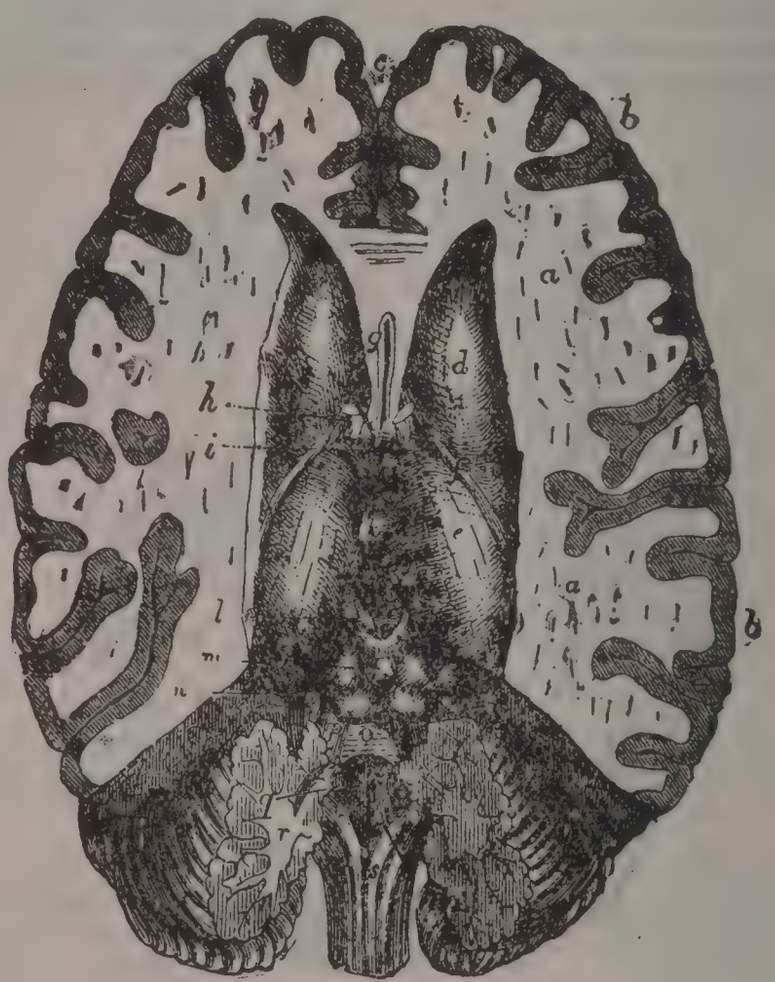


Fig. 4.—Human adult Brain:

In this dissection the cerebral lobes have been sliced off, and the lateral ventricles opened; to allow a view of the cerebellum, the posterior part of the cerebrum has been cut off opposite *n*.

a, *a*, remains of white oval centre; *b*, *b*, gray outer portion or cortex of hemispheres: *c*, longitudinal fissure; *d*, corpus striatum, or streaked body lying in lateral ventricle; *e*. optic thalamus, *f*, tænia semicircularis or worm-like body; *g*, the two layers of septum lucidum, open to show fifth ventricle; *h*, anterior crura, or portions of the fornix, one of the great antero-posterior commissures; *i*, points to the foramen of Monro, a bristle is sticking down into the third ventricle; *k*, is the middle, or soft transverse commissure, joining the two optic thalami—sometimes absent, and easily destroyed; *l*, a bristle passed from the third to the fourth ventricle (*q*), the transverse lines beneath it indicate the posterior transverse commissure; *m*, the pineal gland, lying on *n*, the corpora quadrigemina; *o*, valve of Vieussens, a layer of gray matter from cerebellum; *p*, processes which connect the cerebellum to corpora quadrigemina: *q*, section of cerebellum, line points to gray matter in fourth ventricle; *r*, white matter projecting into the gray, giving a toothed or arborescent appearance, hence the name, arbor vitæ; *s*, posterior pyramids or back of medulla oblongata.

slicing the B. transversely with a knife, the section appears white in the centre, and gray at the margins of the *convolutions*, which are now seen penetrating to various depths below the surface. The white substance is dotted with the blood-vessels which supply the brain. On drawing the hemispheres asunder from each other with the fingers, the great commissure, or uniting band, is seen, the *corpus callosum*, which is streaked both longitudinally and transversely. If the hemispheres are now completely sliced off on a level with this commissure, its transverse fibres will be seen to extend into their substance, constituting a large white surface, called by anatomists the *white oval centre*.

If we take the handle of the knife, and scratch with it through this white substance on each side, the instrument soon opens a cavity, which is the *lateral ventricle* (fig. 4). These ventricles are shaped somewhat like the italic *S*. Their extremities are termed cornua, and the anterior look away from each other, and are nearer than the posterior, which are turned the opposite way. The pia mater, which supports the vessels bringing blood to the B. substance, is seen in a purple wreath lying in each ventricle, and passing down into a depression termed the *middle horn* of the ventricle. This is the *choroid plexus*, and, if lifted, it will be found continuous with that on the opposite side, through an aperture called the Foramen of Monro, *i*, after the great Scotch anatomist of that name. If the remains of the corpus callosum are now scraped away, the choroid plexus will be found continuous with a web of pia mater called the *velum interpositum*, which lies over the central cavity of the B., or third ventricle. In front and behind will be seen portions of the inferior longitudinal commissure or *fornix*, *h*, the body of which has been removed to show the velum; but, placed vertically between its anterior part and the under surface of the corpus callosum, are two layers of gray matter, between which is a narrow space termed the *fifth ventricle*, *g*. Behind, there will be seen a small hole, through which a probe will pass into the *fourth ventricle*, *l*.

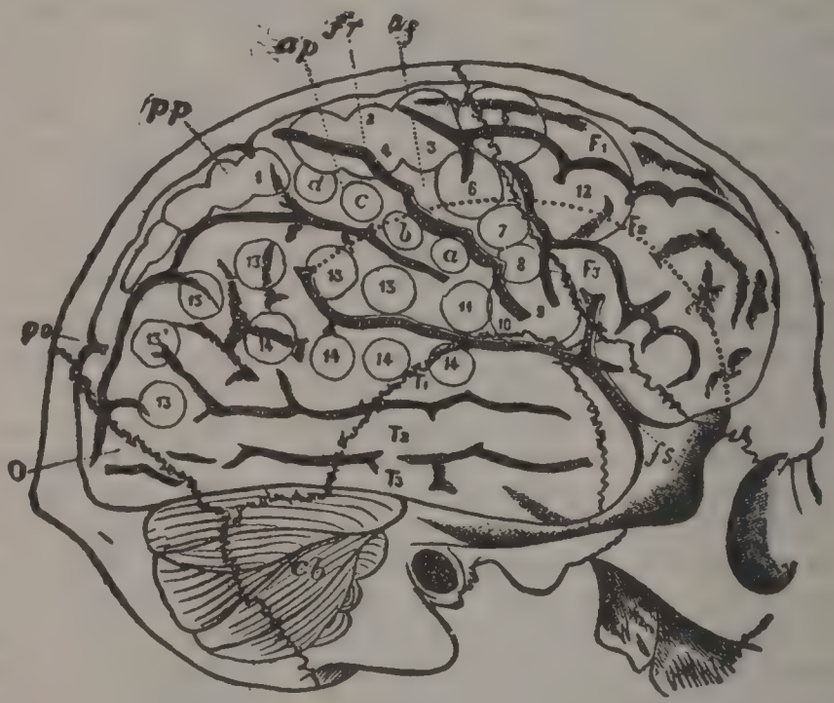
The accompanying cut (fig. 4) shows the parts now exposed. The mass most in front is the *corpus striatum*, *d*; behind it is the *optic thalamus*, *e*. Through the former, motor fibres pass from the anterior columns of the spinal cord into the hemisphere; through the latter, the sensory fibres from the posterior columns of the cord. These are by some considered the ganglia of motion and *common* sensation.

Behind there are the *corpora quadrigemina*, *n*, which are analogues of the optic ganglia of the lower animals. Upon them lies the *pineal gland*, *m*, and behind them, projecting into the fourth ventricle, *q*, some gray matter, said to be the auditory ganglia. We now come to the upper surface of the *cerebellum*, consisting of two hemispheres split transversely into leaflets, and connected by a central portion to each other and by two bundles of white fibres to the cor-

pora quadrigemina, *p*. Between these is the *fourth ventricle;* and stretched across between them is a thin layer of gray matter, called the *valve of Vieussens, o*.

We now turn what remains of the B. upside down, and examine the base or under surface. It is very irregular in outline. The cerebral hemispheres are now found divided on each side by a *fissure* (*Sylvian*), *f*. The part in front is called the *anterior lobe;* that behind the *middle*, as far as the cerebellum, when it is called the *posterior lobe*.

The diagram (fig. 5) gives a better idea of the appearance than words could possibly do. The olfactory lobes, *h*, *h*, are now seen lying in a fissure in the anterior lobes. The



Outer Aspect of Brain, showing relation to the Bones of the Skull, and the Position of Ferrier's Areas (Landois): *fr*, Fissure of Rolando; *fs*, fissure of Sylvius; *po*, parieto-occipital fissure; F 1, superior, F 2, middle, F 3, inferior frontal; *af*, ascending frontal convolution; *ap*, ascending parietal; *pp*, postero-parietal convolution; T 1, superior, T 2, middle, T 3, inferior temporo-sphenoidal convolution; O, occipital lobe; *cb*, cerebellum; 1 (postero-parietal convolution), advance of the opposite leg, as in walking; 2, 3, 4 (round upper extremity of fissure of Rolando), complex movements of opposite leg, arm, and of the trunk, as in swimming; *a*, *b*, *c*, *d*, (ascending parietal convolution), individual and combined movements of the fingers and wrist of the opposite hand, or prehensile movements; 5 (posterior end of superior frontal convolution), forward extension of opposite arm and hand; 6 (upper part of ascending frontal convolution), supination and flexion of opposite fore-arm; 7 (median part of ascending frontal convolution), retraction and elevation of opposite angle of the mouth; 8 (lower part of ascending frontal convolution), elevation of ala nasi, and upper lip, with depression of lower lip; 9 and 10, opening of mouth with protrusion and retraction of tongue—on the left side is aphasic region; 11, between 10 and lower end of ascending parietal convolution, retraction of opposite angle of the mouth, the head turns slightly to one side; 12, posterior part of the superior and middle frontal convolutions (eyes open widely, pupils dilate, head and eyes turn toward opposite side); 13, 13′ (supra-marginal and angular gyrus), eyes move toward opposite side, or upward and downward (centre for vision); 14, superior temporo-sphenoidal convolution (centre for hearing.).

optic tracts are seen meeting at their commissure, *i*, interchanging fibres, and passing on as the optic nerves to the orbit. The larger bundles behind, and directed outwards, are the *crura cerebri*, *p*, passing toward the hemispheres, emerging from the transverse mass called the *pons Varolii*, *s*, which lies like a clamp between the two halves of the cerebellum, *d*. From the inner side of each crus arises the third nerve, *o*, destined to supply four of the muscles which move the eyeball. The fourth nerve, *q*, comes from the valve of Vieussens, and is seen on its way to supply the superior oblique muscle which turns the eye upward and outward, hence called *patheticus*. From each side of the

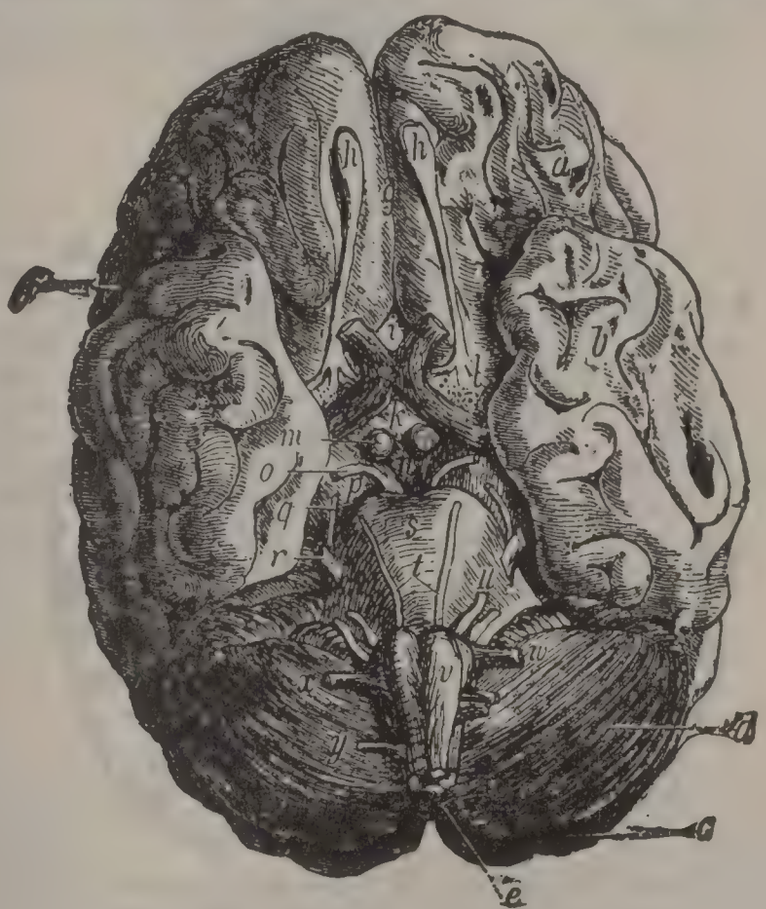


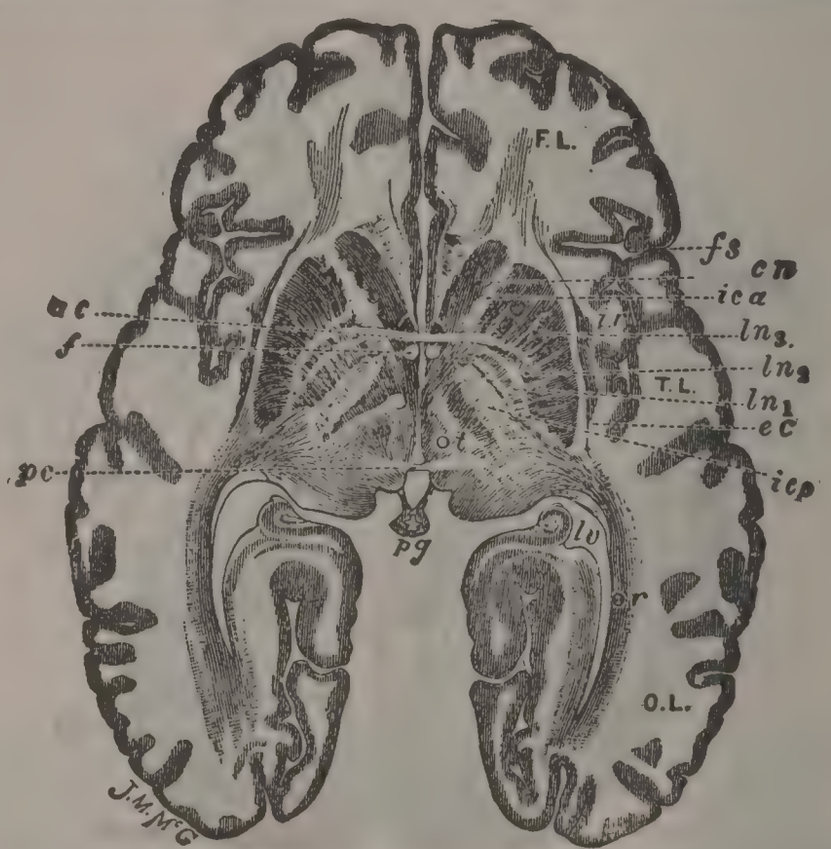
Fig. 5.—Human adult Brain:

Seen from below—membranes removed.

a, anterior lobe of cerebrum; *b*, middle lobe; *c*, posterior lobe of cerebrum, appearing behind; *d*, cerebellar hemisphere; *e*, medulla oblongata; *f*, fissure of Sylvius; *g*, longitudinal fissure; *h*,*h*, olfactory bulbs; *i*, optic commissure—the optic nerves are seen interchanging fibres; *l*, three roots of olfactory process; *m*, white round bodies (*corpora albicantia*), the terminations of the anterior portions of fornix; *n*, where the vessels perforate the brain substance, hence called posterior perforated space; *o*, third pair of nerves coming to supply muscles of the eyeball, from *p*, the crus cerebri; *q*, fourth nerve, turning round from the valve of Vieussens; *r*, fifth pair; *s*, pons varolii; *t*, sixth pair of nerves; *u*, seventh pair, portio dura for muscles of face, and portio mollis for hearing; *v*, posterior pyramids of cerebellum, seen to interchange fibres; *w*, and two below, are eighth pair—viz., glossopharyngeal, vagus (pneumogastric), and spinal accessory nerve; between *w* and *v* is the small prominence called olivary body; *x*, *y*, two roots of ninth pair of nerves, motor nerve of tongue.

pons the fifth pair, *r*, arises; the sixth, *t*, between the pons and the anterior pyramids of the medulla oblongata; *w* is the eighth, consisting of: 1. The Glossopharyngeal, or nerve of deglutition; 2. The Pneumogastric, distributed to the respiratory apparatus and stomach; and with it, 3. The Spinal Accessory.

Inflammation (acute) of the B. (*phrenitis*, or popularly Brain-*fever*) rarely occurs separately, and can scarcely be distinguished from inflammation of its membranes (meningitis). In the first stage there is rapid pulse, severe headache, the eyes suffused, with the pupils contracted to a small point, and very intolerant of light. The



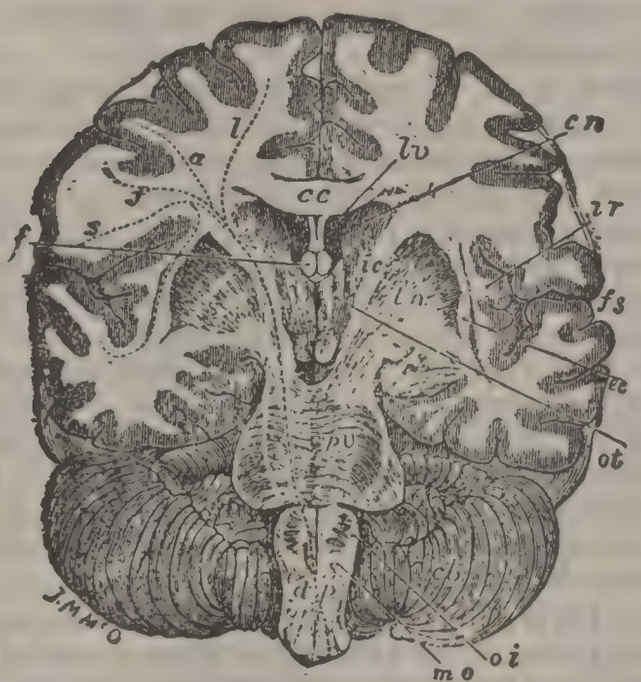
Brain.—Transverse Section of Cerebrum in plane of line CD: F.L., frontal; T.L., temporal; O.L., occipital lobes; *fs*, fissure of Sylvius; *ir*, island of Reil: *cn*, caudate nucleus; *ln* 1, *ln* 2, *ln* 3, the three divisions of the lenticular nucleus, *ica*, anterior limb of internal capsule; *icp*, posterior limb of internal capsule (the anterior part conveys motor, the posterior part sensory fibres), the part generally injured in cerebral hemorrhage; *ot*, optic thalamus; *or*, optic radiation, probably conveys sensory fibres to occipital and temporal lobes; *ac*, anterior commissure, connects both temporal lobes; *f*, fornix; *pc*, posterior commissure; *pg*, pineal gland, *lv*, lateral ventricle (posterior horn).

patient is constantly watchful, and much annoyed by even ordinary sounds. Then furious delirium sets in, and lasts for a period, varying with the case, generally 12–48 hours, when it is succeeded by collapse, in which the patient lies in stupor—his face devoid of color, and covered with cold sweat. If roused, he now speaks with slow, indistinct utterance; the pupils are dilated and do not contract on exposure to the brightest light; and the loudest speaking

ceases to annoy him. The stupor increases with the general prostration, and continues till death. After death, serous fluid is found upon and in the B., deposits of lymph, thickening of the membranes, and softening of the B. substance itself.

General and local bleeding, with antimony and digitalis, to subdue the pulse; mercury, to prevent the deposit of lymph, blisters, as counter-irritants, to the back of the head and neck, are the usual remedies for this rare but serious disease.

Softening of the Brain is a frequent result of chronic inflammation. The patient has been for some time in low health, troubled with headaches, loss of appetite, depression of spirits, and a gradual loss of memory and acute perception of things in general. Then a spasm may



Vertical Transverse Section of Brain in direction of line AB. The shaded outline of cerebrum indicates the superficial gray matter. *fs*, Fissure of Sylvius; *ir*, island of Reil, a convolution at the bottom of the fissure of Sylvius concealed in the adult; *cc*, corpus callosum, the transverse interhemispherical commissure; *lv*, lateral ventricle; *f*, fornix, divided transversely. Between the fornix and the corpus callosum are seen the thin septa lucida; *cn*, caudate nucleus; *ln*, lenticular nucleus (with its three divisions); *ot*, optic thalamus; *ic*, internal capsule; *ec*, external capsule, and outside it a layer of gray matter, the claustrum; *pv*, pons Varolii; *mo*, medulla oblongata; *oi*, inferior olivary body; *cb*, cerebellum; *l*, *a*, *f*, *s*, mark the origin of the dotted lines representing motor fibres passing from the leg, arm, face, and speech 'centres,' through the internal capsule, cerebral peduncles, pons Varolii, medulla oblongata, and crossing at *dp*, the decussation of the pyramids to the opposite side of the spinal cord (to explain crossed paralysis). Another dotted line passes from *s* (speech centre) to hearing centre in first temporal convolution.

occur, followed by paralysis, or the legs and arms may be bent up, and remain in that position. This condition of B. may be caused by want of proper nourishment to the cerebral substance, owing to plugging up or disease of its arteries. When the softening is caused by inflammation, pus is frequently found forming an abscess of the brain.

Induration also may occur as the result of inflammation. —For the other diseases, such as hydrocephalus, see their titles.

Hardening (sclerosis) *of the Brain* occurs as the result of chronic inflammation. The hardening is not uniform, but occurs in patches here and there, and the symptoms necessarily vary according to the location of these spots of hardening. In general there is a loss of control over the legs, a stiff and uncertain gait resulting. There is a tremor of the hands whenever an object, such as a glass of water is grasped. The speech is what is called 'scanning,' that is, each syllable is pronounced separately, as if it were a distinct word, and followed by a pause. There may be paralysis, ocular troubles are common, headache and dizziness are occasionally complained of, there is sometimes weakness of the bladder, and there may be seizures resembling epilepsy or apoplexy.

BRAINE, *brān*, Daniel Lawrence: naval officer: 1829, May 18—1898, Jan. 30; b. New-York. Entering the navy 1846, he was in the Mexican war; was promoted lieut. 1858, was in the first naval battle of the war, commanding the *Monticello* at Sewall's Point, Va., 1861, May 19; and rendered important service near Cape Hatteras; was promoted lieut.commander 1862, July 15; and was commander of the *Pequot* in the attacks on Fort Fisher, Fort Anderson, and the Cape Fear river forts, etc., showing cool bravery; commissioned commander 1866, July 25. He was at Brooklyn navy-yard in charge of the equipment dept. 1869–72; capt. 1874, Dec. 11; commodore 1885, Mar. 2; pres. naval board of inspection, New York, 1885, July 1; rear-admiral 1886, Aug. 12, commanding the s. Atlantic squadron; retired 1891, May 18.

BRAINERD, *brā'nėrd:* city of Minnesota, seat of Crow Wing co., 115 m. w. of Duluth on the e. bank of the Mississippi river, at the Junction of two branches of the Northern Pacific railroad, Water power is supplied by a dam across the Mississippi which also provides immense storage for logs, saw-mills and lumber, furnishing a great industry. The machine, car, and other shops of the Northern Pacific railroad are situated here, and other industrial establishments include flour-mills, foundries, breweries, cigar factories, gas, electric lighting and power plants. B. has a large agricultural trade. Pop. (1890) 5,703; (1900) 7,524; (1910) 8,526.

BRAINERD, David: 1718–47; b. Haddam, Conn.: preacher and missionary to the Indians. He had from childhood deep religious feelings and convictions. B. was expelled from Yale College for attending meetings of the *New Lights*, having augmented the offense by declaring that one of the tutors had no more religion than the chair upon which he sat. In 1742, he was licensed to preach. As a missionary to the Indians, he had wonderful success. He lived in wigwams and endured every hardship until his health failed. Near Freehold, N. J., he

baptized 70 persons in one year, more than half being adults. He wrote a narrative of his labors among the Indians in Massachusetts, Pennsylvania, and New Jersey, 1846. These journals under the titles of *Mirabilia Dei apud Indicos*, and *Divine Grace Displayed*, are among the most interesting works of the kind ever written.

BRAINTREE, *brān'trē:* town of Norfolk co., Mass., 10 m. s.s.e. of Boston, near the shore of Massachusetts Bay, at the junction of the Old Colony, the Granite Branch of the same, and the South Shore railroads. It has electric street railroads, schools, several churches, a public library, and the Thayer Acad. with a fund of $200,000. It is situated in the township of Braintree, which has granite quarries, and manufactures of paper, carpets, boots, shovels, tacks, etc. Pop. (1910) 8,066.

BRAIN'TREE, market-town of Essex, Eng., about 40 m. n.e. from London. It is an old place, having been constituted a market-town by King John. Its streets are narrow, and many of its houses are of wood. It has manufactures of silk, crape, and straw-plait. Pop. 5,000.

BRAINTREE RESOLUTIONS, The: There were instructions given by the town of Braintree, Mass., 1765, Sept. 24, to its representative in the Massachusetts General Court, Ebenezer Thayer, relative to his action in the matter of the Stamp Act. They were drawn by John Adams, one of a committee appointed by the Braintree town meeting for that purpose, accepted unanimously, and published in the Boston *Gazette*. Some 40 Massachusetts towns subsequently adopted them verbatim as their instructions to their own representatives. The resolutions declared the tax, even if legal, an unbearable burden and a vexatious interference with the business of a poor and sparsely settled province; that moreover, it was contrary to British common law, and the 'foundation principles of the British constitution, that we should be subject to any tax imposed by the British Parliament, because we are not represented in that assembly in any sense unless it be by a fiction of law'. They enjoin the Braintree representative to 'comply with no measures or proposals' for executing the law, but 'by all lawful means' obstruct it; to favor entering on the public records 'the most clear and explicit assertion of our rights and liberties'; and—most significant of all—'to agree to no steps for the protection of the stamped paper or the stamp officers, because any addition to the laws for preserving the peace would only exasperate the people and endanger public tranquillity.'

BRAIRD, n. *brārd*, [AS. *brord*, a prick or point, the first blade or spire of grass or corn]: in *agri.*, the first apperance of a crop after the seed has been sown, as oats or barley: V. to sprout, as corn. Braird'ing, imp. Braird'ed, pp.

BRAISE, v., or Braize, v. *brāz* [F. *braise*, glowing embers; from Sp. *brasa*, live coal; O. Ger. *bras;* Gael. *brath*, fire]: to both stew and bake in a stew-pan having a close-

fitting lid of iron for live embers, the meat being thus cooked from above and below: N. the savory viands put with the meat to be braised. BRAIS'ING, imp. BRAISED, pp. *brāzd:* ADJ. cooked by heat both above and below.

BRAIT, n. *brāt* [prov. F. *braed*, to rub or grind down]: a rough diamond.

BRAITHWAITE, *brath'wat*, WILLIAM . 1807–85: English physician; studied at St. George's Hospital, Leeds. He became licentiate of the Society of Apothecaries 1828, member of the Royal College of Surgeons 1829, and 1830 commenced practice at Leeds, where he was appointed lecturer on midwifery and diseases of women and children at the Leeds School of Medicine. In conjunction with James Braithwaite, M.D., Lond., he published *The Retrospect of Medicine* (London, 1840–1885): a half-yearly journal presenting an account of every important discovery and practical improvement in the medical sciences.

BRAIZE, *brāz:* an excellent salt-water food-fish, commonly called Porgy or Paugie.

BRAKE, n. *brāk* [Gael. *brac;* L. *brachĭŭm*, the arm, as the type of exertion and strength: old Dut. *brake*, a clog: Icel. *braka*, to subdue: It. *braca*, a horse's twitch: AS. *bracan*, to pound or knead: Dan. *brage*, to break flax]: a skeleton carriage for training horses; a long, open carriage; a large, heavy harrow for breaking clods; a kneading-trough; an instrument for checking the motion of a wheel—also spelt BREAK; an inclosure for cattle; a bit for horses; a wooden frame for confining the feet of vicious horses in shoeing. BRAKE-MAN, n. one who manages a brake of a carriage. BRAKE-VAN, n. in *railway trains*, a carriage furnished with powerful *brakes*. BRAKE-WHEEL, in *railroad engin.*, the wheel on the platform or top of a carriage by which the brakes are put in action.

BRAKE, n. *brāk* [Dut. *broeck*, a fen or marsh: Ger. *bruch*, a wood in a marshy place: OF. *broil*, copse-wood, cover for game]: broken ground covered with a tangled growth of bushes. BRAKY, a. *brā'kĭ*, rough; thorny; prickly.

BRAKE, n. *brāk*, or BRACKEN, n. *brăk'ĕn* [connected with last as the natural growth of waste places: W. *bruk;* Gael. *fraoch*, heath: Icel. *brok*, sedge: Dan. *bregne*, bracken or fern]: genus of Ferns. *Pteris* (Gr. *pteron*, wing), distinguished by spore-cases in marginal lines covered by the reflexed margin of the frond. The COMMON B. or BRACKEN (*P. aquilina*) is very abundant in most parts of Europe, often covering considerable tracts; and in many parts of America and Asia, and in some parts of Africa. It has a long, creeping, black rhizome, or root-stock, from which grow up naked stalks of 8–18 inches in height; each stalk divides at top into three branches; the branches are bipinnate, the inferior pinnules pinnatifid. The root-stock, when cut across, exhibits an appearance which has been supposed to resemble a spread eagle, whence the specific name *aquilina* [Lat. *aquila*, an eagle]. The root-stock is bitter, and has been used as a substitute for hops: it has

also been ground, mixed with barley, and made into a wretched bread in times of famine. The plant is astringent and anthelmintic; and as such, it had at one time a high reputation, although now little used by medical practitioners. It is employed in dressing kid and chamois leather. The ashes, containing a large quantity of alkali were formerly used in the manufacture of soap and of glass, so that the collecting of them for sale was a considerable resource of the poor in some parts of the Hebrides. B. is used also for thatching, for littering cattle, etc., and occasionally chopped up with straw or hay, for feeding cattle. It forms a favorite covert of deer and of other game; and the word B. often implies a thicket. The abundance of this plant is sometimes regarded as a sign of poor land, though, probably, its absence from the richer

Common Brake:
***a*, end of a branch, much reduced; *b*, end of a pinnule, the lower side, showing fructification.**

soils is very much a result of cultivation. To extirpate it, nothing more is necessary than a few successive mowings of the young shoots as they appear. The annual growth of B. is killed by the first frosts of autumn, but remains rigid and brown, still affording shelter to game, and almost as characteristic a feature in the landscape of winter as in that of summer, perhaps adding to its general desolateness.—*Pteris caudata*, a large species of B. very similar to that of Europe, is one of the worst pests which the farmer has to contend with in the south of Brazil.—*Pteris esculenta*, native of New Zealand, Van Diemen's Land, etc., has a more nutritious rhizome than the common brake. See TARA FERN.—Rock B. (*Cryptogamma crispa* or *Allosorus crispus*, formerly *Pteris crispa*) is a pretty little fern, common on stony hills in the n. parts of Britain.

BRAKE, *brāk:* contrivance for retarding or stopping motion by friction; applied to the wheels and runners of vehicles, hoisting apparatus, etc. In carriages it generally consists of curved blocks of wood fastened to a beam and pressed against the tires of the wheels by means of a lever worked by hand or foot. In wagons, motion was originally retarded by stopping one wheel altogether, by means of a heavy chain. It was not until about 1840, or a little earlier, that patent brakes came into general use. The introduction of this great improvement was considerably retarded by the notion that the tires of wheels were worn off sooner by brakes than by the use of the log-chain. It is a singular fact, too, that the brake-beams were for about ten years attached to the boxes of the wagons. Inventive genius has continually been busying itself in making improvements until systems of brakes have been developed that satisfy every demand. The farmer may by pressing one finger against a lever stop the heaviest load at the steepest hill; and the engineer by a single turn of his hand can instantly apply such tremendous force upon every wheel as will bring a swift moving train to absolute rest in a few seconds. Air-brakes are now in general use on railroads. Under every car there is a cylinder and piston, connected with a combination of levers and rods under control of the engineer, that set brakes against all the wheels. All the cylinders are connected by tubes with a reservoir for compressed air near the locomotive, and filled by a special engine acting automatically. Another system substitutes a vacuum for compressed air.

BRAMA, *brâ'ma:* genus of fishes of the Hen-fish family, *Bramidæ*. *B. Raii*, called Pomfret in Bermuda, has been seen at the Newfoundland Banks, is common on the coast of Wash. and Vancouver's Island; also on the w. coast of S. America and in the Mediterranean; and occasionally on Brit. shores, where it is one of the fishes called Bream, and, mistakenly, Gilt-head. The genus B. has the body very deep and compressed, the head rather obtusely terminated, a single elongated dorsal fin, and the anal fin with a very lengthened base. The tail is forked, its points extremely divergent. This fish is sometimes more than two ft. in length. Its flesh is of exquisite flavor.

BRAMAH, *brâ'ma*, JOSEPH: practical machinist: 1748, Apr. 13—1814, Dec. 9: b. Stainborough, Yorkshire; son of a farmer. He early showed unusual talent for mechanics. Incapacitated in his 16th year from agricultural labors by an accidental lameness, he was apprenticed to a carpenter and joiner, and afterward obtained employment with a cabinet-maker in London. Subsequently, he established himself in business in the metropolis, and became distinguished for the number, value, and ingenuity of his mechanical inventions, such as safety-locks, and improvements in pumps and fire-engines, in the construction of boilers for steam-engines, in the processes of making pa-

per, in the construction of main-pipes, wheel-carriages, the beer-machine used at the bar of public-houses, and many others. In 1795 he patented the hydrostatic press known by his name: see HYDRAULIC PRESS. In all he took out about 20 patents.

BRAMAH-PRESS, *brâ'ma-prĕs:* a hydrostatic press of immense power, so named after the inventor, Joseph Bramah (q.v.).

BRAMANTE, *brâ-mân'tā*, DONATO LAZZARI: 1444–1514; b. Monte-Asdroaldo, in the duchy of Urbino: Italian architect and painter. From 1476–99, he resided in Milan, where he studied geometry and perspective, neither of which sciences was well understood by artists in his day. He was noted as one of the best painters in Lombardy; but his success in architecture eclipsed his fame as a painter. In Milan, he built the choir of Santa-Maria delle Grazie, and the church of Santa-Maria presso San-Satiro. After the fall of Ludovico Sforza, B. went to Rome, where he was employed first by the pope Alexander VI., afterward by Julius II. The first great work which he undertook for the latter was to connect the Vatican palace with the two pavilions of the Belvedere by a series of immense galleries; the second was the rebuilding of St. Peter's Church, of which he laid the new foundation 1506. When only a small portion of his plans had been realized, B. died at Rome, and succeeding architects departed widely from the original design of a grand cupola over a Greek cross. Among other works of B. in Rome may be mentioned the palaces Cancellaria and Giraud (now Torlonia), in which he adhered more strictly than in other works to antique forms but not without a characteristic grace in his application of these.

BRAMBACH, *brâm'bâch*, KASPAR JOSEPH, German composer: b. Bonn, 1833, July 14. He was a pupil at the Conservatory in Cologne (1851–4), and at Frankfort-on-the-Main he studied under Ferdinand Hiller. In 1859 he became a teacher at the Cologne Conservatory, and in 1861 went to Bonn as state musical director. Giving up that position in 1689, he devoted himself to the work of composing and private teaching. His best works are his cantatas, including *The Eleusinian Festival; A Hymn to Spring; The Power of Song; Alcestis; Prometheus; Colombus;* and *Lorelei.* He has also written an opera, *Ariadne*, and several minor pieces.

BRAMBANAN, *brâm-bâ'nân:* district of the province of Soorakarta, Java, rich in remains of Brahmanical temples, superior in magnificence to any in India. The edifices are composed entirely of hewn stone, and no mortar has been used in their construction. In all, there are 296 temples, disposed in five parallelograms one within the other. The outer one consists of 84 temples; the second, of 76; the third, of 64; the fourth, of 44; and the inner one, of 28. In the centre stands the largest and most imposing structure of all. It is 90 ft. high, and profusely decorated with mythological figures, in a moderately good style of art.

BRAMBLE, n. *brăm'bl* [AS. *bremel* or *brembel;* Dut. *braeme,* bramble: Swiss, *brom,* a bud: OH. Ger. *bramal*]: any thorny growth or prickly shrub; a creeping shrub, very rough and prickly, producing a black berry like the raspberry; the *Rubus fruticōsus,* ord. *Rosācĕæ:* (see BLACKBERRY). BRAMBLED, a. *brăm'bld.* BRAMBLY, a. *brăm'blĭ,* full of brambles. BRAM'BLING, n. the mountain finch.

BRAMBLE, a common, but, in America, little used name for various species of the genus *Rubus,* including blackberry, raspberry, and dewberry. In Europe it is more restricted to *R. fruticosus,* which, from its abundance and its weedy character, has not received the attention of horticulturists.

BRAM'BLING, or BRAMBLE FINCH, or MOUNTAIN FINCH (*Fringilla Montifringilla;* see FINCH and FRINGILLIDÆ): bird nearly allied to the Chaffinch (q.v.). It is a little larger than the chaffinch, which it much resembles in general appearance, its bill, and even the disposal of its colors. The tail is more forked. In the males, the crown of the head, the checks, the back and the sides of the neck and the upper part of the back, are mottled in winter with brown and black; but in spring the whole of these parts become a rich velvety black; the throat and breast are of a rich fawn color, which is also the prevailing color of the wings; but they are crossed, when closed by an obilque band of jet-black, and by another oblique band of white. The quill-feathers also are black, edged with yellow on their outer webs; the tail-feathers black, edged with reddish white; the rump and the belly are white; a small tuft of feathers under each wing and some of the lower wing-coverts are bright yellow. The B. is a mere winter visitant in Britain, and the period of its arrival appears to vary according to the severity or mildness of the weather in the more northerly regions. The B. has never been known to breed in any part of the British islands, and even in the s. of Sweden, it is a mere winter visitant. It breeds in the more northerly parts of Scandinavia. It has no song, its call-note is a single monotonous chirp. It is very widely distributed, being found as far e. as Japan, and, in its winter migrations, visiting Italy, Sicily, Malta, Smyrna, etc.

BRAMHALL, *brăm'hawl,* JOHN, Anglican prelate in Ireland: b. Pontefract, Yorkshire, England, 1594; d. 1663, June 25. He was educated at Cambridge, and was on the road to high preferment, when he went to Ireland as Wentworth's chaplain in 1633. He soon became archdeacon of Meath, and was consecrated bishop of Derry in 1634. When the civil war broke out, for safety he crossed to England, but the Royalist disasters soon drove him to the Continent. At Paris he disputed with Hobbes on necessity and the freedom of the will. At the Restoration he was given the metropolitan see of Armagh. Bramhall closely imitated Laud in policy, and even resembled

him in person, but was far his inferior in intellect. Not strong, but merely obstinate in purpose, the so-called Athanasius of Ireland by his impolitic intolerance sealed the doom of Episcopalian supremacy in Ulster.

BRAMLEY, *brăm'lĭ*, FRANK, English artist: b. near Boston, Lincolnshire, 1857, May 6. He was educated at Lincoln and studied art at Antwerp. Among his works are *Domino* (1886); *Old Memories* (1892); *For of Such is the Kingdom of Heaven* (1891); *A Mute, Inglorious Milton* (1898); and several notable portraits.

BRAMPTON, *brămp'tun:* very ancient town in the county of Cumberland, near the Arthing, 8 m. e.n.e. of Carlisle. It is surrounded by hills; and the Castle hill commands a very extensive view. The chief manufacture is the weaving of checks and ginghams; and there are coal-mines in the vicinity. On a rock, two m. to the s., is a Roman inscription, supposed to have been cut by one of Agricola's legions A.D. 207. Two m. to the east stands Lanercost Abbey, founded 1116. Pop. 2,500.

BRAN, n. *brăn* [Bret. *brenn;* W. *bran;* It. *brenna;* F. *bran*—from F. *bren,* excrement, ordure—from Gael., *bran,* chaff, husks]: the husks or shells from ground wheat; the husks of any grain. BRANNY, a. *brăn'nĭ,* consisting largely of bran; presenting the appearance of bran or small scales.

Bran is obtained from the outer covering or husks of grain during the process of grinding, and is separated from the finer flower before the latter is made into Bread (q.v.). It is in the form of thin, scaly, yellowish-brown particles, with sharp edges. Bread, known as Brown Bread, is sometimes made from flour containing bran. B. is used also in brightening goods during the process of Dyeing (q.v.) and in Calico-printing (q.v.). In med. B. is applied in poultices to relieve sprains, inflammation, etc.; and an infusion is used as an emollient footbath. The principal use of B. is for feeding to live-stock. For this purpose it is valuable not only for the nutritive matter which it contains, but also for its richness in mineral elements which make the manure of animals fed with B. an efficient fertilizer. The average of many analyses gives the percentages of digestible nutrients of B. as follows:

Albuminoids	12·6
Carbo-hydrates	42·7
Fat	2·6

It is well to feed B. in connection with materials containing larger proportions of starch and fat.

BRANCA, *brän'kä,* ASCANIO, Italian statesman: b. 1840. He studied law at Naples and did journalistic work, and in 1870 was elected to the Italian Chamber of Deputies. He was later made secretary of the ministry of commerce but withdrew from this position in 1885, disapproving of the policy of the ministry. In 1891–2 he was minister of public works in Rudini's cabinet; in 1896–8 minister of finance, and 1900–2 again minister of public works. He has written *International Banking and Credit* (1871).

BRANCALEONE, *brân-kâ-lā-o'nā*, DANDOLO, Count of Casalecchio, *kâ-zâ-lĕk'ke-o:* 13th c.,; b. Bologna: Italian nobleman, invested with the powers of dictator, in order to suppress anarchy and restore law and order in those troubled times. Having received the terrible mission of crushing feudalism, 1253, he besieged in their castles the nobles and their hirelings, seized alike gentleman and free-booter, and razed to the ground 140 fortresses. He set a limit even to the temporal power of Pope Innocent IV., and was driven from Rome, but recalled two years afterward. He died 1258, hated by the nobility but beloved by the people.

BRANCH, *bransh*, JOHN, American statesman: b. Halifax County, N. C., 1782, Nov. 4; d. Enfield, N. C., 1863, Jan. 4. He graduated at the University of North Carolina (1801), studied law, became a judge of the superior court, State senator (1811–17). He was governor of his state (1817–20), and a member of the United States Senate (1823–9). He was appointed secretary of the navy by President Jackson, and held this office till the breaking up of the Cabinet in 1831. In 1835 he was a member of the convention to revise the State constitution, and in 1843 was appointed governor of the Territory of Florida, serving until the election of a governor under the State constitution, when he retired to private life. See Lanman: *Biographical Annals of the Civil Government of the United States.*

BRANCH, MARY LYDIA BOLLES, American writer of stories for young people: b. New London, Conn., 1840, June 13. She was married to John L. Branch in 1870. Her published works include *The Kanter Girls* (1893); *The Old Hempstead House* (1896); *A Visit to Newfoundland* (1901); *The Manner of Life of Nancy Hempstead* (1902); etc.

BRANCH, n. [Bret. *brank;* It. *branca;* F. *branche*, the branch of a tree: It. *branca*, the fang or claw of a beast]: the shoot of a tree or plant; an arm; any part of a body or system; a descendant from a common parent: V. to divide into parts; to spread out. BRANCH'ING, imp.: ADJ. spreading in branches. BRANCHED, pp. *brănsht.* BRANCH'LESS, a. without shoots or branches. BRANCHY, a. *bransh'ĭ*, full of branches. BRANCH'INESS, n. the state or condition of abounding in branches. BRANCH-CHUCK, a chuck having four branches, each of which has a screw whose end may be made to impinge upon the object. BRANCHED-WORK, in *arch.*, carved or sculptured branches or leaves in monuments or friezes. BRANCH'LET, n. a little branch. ROOT AND BRANCH, wholly; totally.

BRANCH, in Botany: a part of a tree or other plant not taking its rise immediately from the root, but rather forming a sort of division of the stem, and often divided into secondary branches, again, perhaps, further much ramified into *branchlets* and twigs, the ultimate ramifications

producing leaves, flowers, and fruit. Branches originate in leaf-buds. which are produced at the *nodes* of the stem, or of the already existing branches. See BUD: PLANT: STEM. The buds being formed in the axils of leaves, the arrangement of the branches as alternate, opposite, whorled, etc., varies like that of the leaves, but buds often remain dormant, according to a regular law of alternation. The angles of ramification are very different in different plants, producing great variety of appearance, and giving marked characteristics to different kinds of trees; instance, great difference between the ramifications of the *Coniferæ* (pines and firs) and that of other trees. In many herbaceous plants whose axis is scarcely developed into a stem, instead of branches there proceed from the lateral buds *runners*, which lie close to the ground, send down roots, and produce new plants, as in the strawberry.

BRANCHIÆ, n. plu. *brăng'kĭ-ē* [Gr. *brangchia*, the gills of a fish]: the gills or breathing organs of animals living entirely in water: see GILLS. BRAN'CHIAL, a. *-kĭ-ăl*, relating to the gills of fishes. BRANCHIOPODA, n. plu. *brăng'kĭ-ŏp'-ŏ-dă*, also BRAN'CHIOPODS, n. plu. *-kĭ-ŏ-pŏdz* [Gr. *podes*, feet]: crustacean animals having gills attached to the feet. BRAN'CHIOP'ODOUS, a. *-ŏp'ŏ-dŭs*, gill-footed. BRAN'CHIOS'TEGAL, a. *-kĭ-ŏs'tĕ-găl*, or BRAN'CHIOS'TEGOUS, a. *-tĕ-gŭs* [Gr. *stego*, I cover]: gill-covering—applied to certain bones or bent rays which support the membrane covering and protecting the gills of fishes. BRANCHIATE, a. *brăng'kĭ-āt*, possessing gills or branchiæ. BRANCHIFERA, n. plu. *brăng-kĭf'ĕr-ă* [L. *fĕro*, I carry]: a division of gasteropodous mollusks in which the respiration is aquatic, and the respiratory organs are mostly in the form of distinct gills.

BRANCHIOPODA, *brăng-kĭ-ŏp'ŏ-da* [Gr. gill-footed]: order of *Crustacea* (q.v.), including Ostracoda, Cladocera, and Phyllopoda, the first two sub-orders, and part of the third, with a bivalve carapace; they breathe by their flattened legs. They are all small creatures, many almost microscopic, and abound chiefly in stagnant fresh waters. Some are popularly known by the name of Water-fleas (q.v.); the Brine-shrimp (q.v.) is another example; and the genera *Daphnia* and *Cypris* may be mentioned, the former on account of its great frequency in stagnant fresh waters, the latter because its hard shells resist decomposition, and are therefore abundant in a fossil state.

BRANCO, RIO, *rē-o brân'ko:* river of that portion of Brazil which, originally comprised within the understood limits of Guiana, lies n. of the Amazon. It rises in the Parime Mountains, on the very borders of Venezuela; and after a s. course of about 400 m., it joins, near lat. 1° 20′ s., long. 62° w., the Rio Negro, of which it is the principal tributary, on its way to the Amazon.

BRAND, n. *brănd* [Icel. *brandr;* Ger. *brand*, a burning fragment of wood, a sword-blade: It. *brandone*, a large piece of anything]: a burning piece of wood; a sword--so named from its glittering as a flaming torch when moved

about; a stake of burning wood as taken from the fire and extinguished; a mark made by pressing a hot iron mold, as on a barrel: see FISHERIES; a trade-mark: see TRADE-MARKS; a mark of infamy; a stigma: V. to burn or mark anything with an iron mold red-hot; to fix a mark of infamy on any one; to stigmatize. BRAND'ING, imp.: ADJ. stamping as with a brand. BRAND'ED, pp. BRAND'-IRON, or BRANDING IRON, n. an iron mold to brand with. BRAND-NEW, a. bright and fresh, as the glitter of a flaming torch; fresh like a newly impressed trade-mark. BRANDLING, n. *brănd'lĭng*, a red worm used by anglers; a fish. BRANLIN, n. *brăn'lĭn*, a fish of the salmon kind.

BRAND: name given in some parts of Britain to some of those diseases of plants, especially of corn-plants, which are called also BLIGHT, BUNT, MILDEW, RUST, and SMUT: (see these titles). It is the German name for the disease generally known in Britain as BUNT, sometimes as *Pepper-brand*. Both as a German and an English word, it seems derived from the verb *brennen*, to burn, and to refer to the burnt appearance produced by the diseases. Its most common application in Britain, however, is not to the diseases already mentioned, but to a peculiar spotted and burnt appearance often seen on the leaves, and sometimes also on the bark of plants, which does not seem connected with the presence of parasitic fungi, but which sometimes becomes so extensive as to cause the death of the plant. The nature of this disease is still somewhat obscure. Occurring most frequently when warm sunshine succeeds to moist weather or to hoar-frost, and frequently affecting plants in hotbeds upon which drops of condensed moisture fall from the frame, it has been ascribed to the concentration of the sun's rays by the drops of water on the leaf or bark—a theory utterly untenable, as no concentration can take place in such circumstances. The probability appears to be, that the action of the moisture unequally distributed, and particularly when sudden changes of temperature take place, deranges the vegetable functions and destroys the fine tissues.

BRANDE, *brănd*, WILLIAM THOMAS: 1788–1866; b. London: English chemist, fellow of the Royal Soc., successor of Sir Humphrey Davy in the chair of chemistry in the Royal Instituton, 1813. He was joint editor with Faraday of the *Quarterly Journal of Science and Art*, 1816–36. He acquired renown as a lecturer, and published a *Manual of Chemistry*, translated into French, German, and Italian; and 1842 took the superintendence of the *Dictionary of Science, Literature, and Art*, an excellent work.

BRANDENBURG, *brân'dĕn-bûrg:* province of Prussia, in the centre of the kingdom, lat. 51° 30′–53° 45′ n., long. 11° 13′–16° 8′ e.; 15,350 sq. m. It formed the nucleus of the Prussian monarchy, but the modern province does not quite correspond with the old *Mark* of B., which included also a part of the province of Saxony and of Pomerania, while it lacked certain small portions of territory now con-

tained in the province of B. Almost the whole province is a plain, so low that at Potsdam the surface of the river Havel is only 14·6 Prussian or about 15 English ft. above the level of the sea. The ground becomes slightly hilly toward Silesia. In general, the soil is sandy and naturally unfruitful. Without its numerous rivers and canals, B. would be one of the most barren tracts on the continent. The inhabitants are mostly Germans, mixed with French and Dutch colonists, who, however, are almost completely Germanized; and in the s. of the province, with people of Wend extraction. With the exception of 87,000 Rom. Catholics, and 41,000 Jews, they belong to the Prot. Church. Agriculture and the rearing of cattle afford occupation for a considerable number of the inhabitants. The manufactures are silk, cotton, wool, linen, sugar, leather, paper, metals, etc. There are numerous distilleries. B. is divided into the governments of Potsdam and Frankfurt—Berlin, the capital, forming a separate jurisdiction. In the beginning of the Christian era, B. was inhabited by the Suevi, afterward by Slavonic tribes. It was subjugated by Charlemange 789, but again acquired independence under his weak successors, and remained free till 928, when Henry I. possessed himself of it. After passing through numerous changes in connection with the general history of the German empire—of which there is need to mention here only that Albert the Bear (q.v.) became the first Markgraf of B. 1142, and Frederick of Nürnberg, the first elector 1417—it became associated with the rise of the Prussian state into a monarchy under Frederick I., Elector of Brandenburg, 1701. See PRUSSIA. Pop. (1900) 3,108,554, with Berlin, 4,997,402.

BRAN'DENBURG (ancient *Brennaborch* or *Brennabor*): town from which the province B. is named; on the line of the Berlin and Magdeburg railway, about 37 m. w.s.w. of Berlin. The river Havel divides it into two parts, Old and New B., both surrounded with walls. On an island in the river there is a third quarter, containing the castle, cathedral, equestrian college, etc. The cathedral has a fine old crypt and several interesting antiquities. The Confession of B. was a formula of doctrine prepared by order of the Elector of B., who hoped thereby to harmonize the adherents of Luther with those of Calvin, and to end the disputes raised by the Augsburg confession (q.v.). The people of B., inclusive of the garrison, are engaged in the manufacture of woolen, linen, hosiery, paper, leather, beer, etc. Boat-building is also carried on to a considerable extent. Pop. 49,300.

BRANDENBURG, NEW: walled town in the grand duchy of Mecklenburg-Strelitz, n. Germany; near the n. end of Lake Tollen, about 50 m. w.N.w. of Stettin. It is a beautiful town, with regular, broad, and well-built streets. The grand duke has a palace in the market-place. It has manufactures of woolen, cotton, damasks, leather, paper, tobacco, etc., beside corn-mills, oil works, and a trade in

hides and horses, and is altogether a very thriving place. Pop. 10,500.

BRANDES, *brân'dĕs*, Georg Morris Cohen, Danish literary critic of Jewish family: b. Copenhagen, 1842, Feb. 4 He graduated at the university of Copenhagen in 1864, and taught there, 1872–7. Several books on æsthetic and philosophic subjects brought on him a charge of skepticism which was not removed by an epoch-making series of lectures, delivered before large audiences, and published under the title, *The Main Literary Currents of the Nineteenth Century* (1872–82); for his description of the later intellectual position of Europe, as broken away from the orthodoxy and romanticism of the beginning of the century, brought on him the bitter attacks of all the reactionary forces in Denmark. His *Danske Digtere*, a masterpiece of psychological analysis, appeared in 1877; but the hostility of his enemies induced him in the same year to leave Denmark, and settle in Berlin, where he published, among other works, critical biographies of Lasalle (1877); Esaias Tegnér (1878); and Lord Beaconsfield (1879). Then a lecture tour through Norway and Denmark brought a powerful party to his side, and in 1882 he returned to Copenhagen, his countrymen having guaranteed him an income of $1,000, with the one stipulation that he should deliver public lectures on literature. Among his later works are: *Den Romantiske Skole i Frankrig* (1882); a biography of Ludvig Holberg (1885); a valuable study of Shakespeare, published in an English translation in 1899; *Impressions of Russia* (1888); *Poems* (1899); *Berlin as an Imperial Court; Soren Kierkegaard; Danish Poets; Impressions of Poland; Men and Works; Men of the Modern Revival; A Study of Ibsen; Complete Works* (15 vols. 1905). Brandes is not only the foremost critic of Denmark, but one of the great literary critics of his age.

BRANDING: mode of punishment formerly inflicted on various classes of offenders. It was effected by the application of a hot iron, the end of which had the form which it was desired should be left imprinted on the skin. The canon law provided for B.; and in France till 1832 galley slaves were branded with the letters T F (*travaux forcés*). In England B. was formerly employed in the case of all *clergiable* offenses by burning on the hand (see Benefit of Clergy). Till 1879 the punishment of marking with the letter D (deserter) or B C (bad character), by tattooing with needles and India ink, was used in the British army.—Upon large ranches in the w. United States B. is the common method of marking cattle so they can be identified by their owners.

BRANDIS, *brân'dis*, Christian August: prof. of philosophy in Bonn: 1790, Feb. 13—1867, July 24; b. Hildesheim; son of J. D. Brandis, one of the most distinguished physicians of his time. Having studied philology and philosophy at Kiel and Göttingen, he began lecturing in the Univ. of Copenhagen, from which he removed to

Berlin (1816). Here he was soon called to take part in the preparations for the great critical edition of the works of Aristotle, contemplated by the Berlin Acad. of Science, 4 vols. (Berlin, 1831–36), and with this object, spent several years, with Immanuel Bekker (q.v.), in exploring the chief libraries of Europe. In 1821, he resumed his academic career in the Univ. of Bonn, where he edited Aristotle's *Metaphysics* (vol. i., Berl. 1823), *Scholia in Aristotelem* (Berl. 1836), and *Scholia Græca in A. Metaphysicam* (Berl. 1837). He accepted, 1837, a call from the young king of Greece, and spent several years in that country as cabinet counselor. He published three volumes on Greece 1842. Other works are his history of Greek and Roman Philosophy (3 vols. 1835–66), and another work in the same field (1864).

BRANDISH, v. *brăn'dĭsh* [F. *brandissant*, brandishing —from *brandir*, to wave or shake a brand—from OF. *brand*, a sword: Manx, *brans*, dash: OF. *bransler*, to shake (see BRAND)]: to shake a brand or sword, then any other weapon; to move up and down; to shake as a spear or stick; to wave or flourish. BRAN'DISHING, imp.; N. act of one who brandishes. BRANDISHED, pp. *brăn'dĭsht*.

BRANDON, *brăn'dun:* town of Rutland co., Vt.; on the Central Vermont railroad, 16 m. n.n.w. of Rutland, 51 m. s. of Burlington. It is in B. township, about 1 m. e. of Otter Creek. Otter Creek, in a section containing irons, coal, and lignite mines and noted quarries of fine marble supplying the eastern states. The town has manufactures of iron castings, paint, carriages, wool, spools and leather, and is an active trading centre with an academy, good hotels, and two parks. Pop. (1900) 2,759; (1910) 2,712.

BRANDON, Canada, a city in the province of Manitoba, on the right bank of the Assiniboine river, below its junction with the Little Saskatchewan; and on the Canadian Pacific railway, 132 m. w. of Winnipeg. The city is situated on the gravelly slopes of the south bank of the river, is the railway centre for a rich agricultural region, and has become the second city in size and in importance in the province. The principal manufacturing establishments are machine works, car shops, saw-mills, binder-twine factory, flour mills, grain elevators, woolen mills, pump works, breweries, etc. Both the residential and business sections of the city are substantially built; there are a court-house, a general hospital, Brandon College (Baptist), Brandon Ladies' College just opened, numerous churches and public schools, and several banks. Not far from the city are the Manitoba Experimental Farm of 670 acres, a Provincial Insane Asylum and the Indian Industrial School. Brandon also contains several parks, and has excellent sewerage and water systems. The name was first given in 1794 to Brandon House, a small trading post on the Assiniboine, 13 m. e. of the present city, and also to a range of hills south of the city, but the actual founding of the town did not take place, however, till 1881. Since

then it has steadily grown in importance. Pop. (1891) 3,778; (1901) 5,380; (1907 estimated) 7,500.

BRANDSTETTER, *brânt'-stĕt-ĕr* HANS, Austrian sculptor: b. Hitzendorf, near Graz, 1854, Jan. 25. He first studied wood-carving in Graz and later went to the Academy at Vienna where he was a pupil of Hellmers. His three earliest works won the prize given by the Academy; these are *Lot's Flight from Sodom*, *The Flute-player*, and *Plato*. Among his other works may be mentioned his bronze *Forest Lily; Prometheus; The Return of the Prodigal Son;* and the busts of Hamerling and Rosegger.

BRANDT, *brânt*, CARL LUDWIG, German-American painter; b. near Hamburg, Germany, 1831, Sept. 22; d. Savannah, Ga., 1905, Jan. 19. He studied art in European art galleries, came to the United States in 1852, and thereafter painted portraits and historical scenes. He became a member of the National Academy in 1872, and was a director of the Telfair Academy of Arts and Sciences at Savannah, Ga.

BRANDT, GERHARD, Dutch Arminian clergyman: b. Amsterdam, 1626; d. there, 1685. After completing his studies and making himself a thorough Hebrew and Greek scholar, he became pastor of the Remonstrants, first at Nieukoop and afterward at Amsterdam. His works, almost all written in Dutch, include a *Life of Admiral Michel Ruyter*, which has been translated into French; a *Narrative of the Trial of Barneveld, Hoogerbeets, and Grotius;* and a *History of the Reformation*. The last work, on which his fame chiefly rests is remarkable for the elegance of its style, but written too much in the spirit of partisanship.

BRANDT, HERMAN CARL GEORGE: philologist: b. Vilsen Germany 1850, Dec. 15. He came to this country, and after graduating at Hamilton Coll. 1872, he pursued his studies at Auburn Theol. Sem. and in Göttingen and other German universities. Since 1882 he has been prof. of French, German, and philology in Hamilton Coll. Among his publications are: *German Grammar for High Schools and Colleges* (1884, 6th ed., 1892); *German Reader* (1889, 3d ed. 1892); *German-English and English-German Dictionary* (1903).

BRANDT, JOSEF VON, Polish painter: b. Szczebrzeszyn, 1841, Feb. 11. He first studied engineering at Paris, then took up painting at Munich as a pupil of Franz Adam and Karl Piloty and opened his own studio. His pictures mostly illustrate the soldier life of the 17th century though he has painted also some excellent pictures of Polish peasant life. His works include *Polish Peasants at the Inn; Episode of the Thirty Years' War; The Battle with the Turks near Vienna, Sept.* 12, 1683; *Cossack Camp; Tartar Battle; Cossacks on the March; Cossacks' Triumphal Song;* and *Defense of a Farmyard by Polish Cavalry.*

BRANDT, MARIANNE (family name, MARIE BISCHOF).

German opera singer: b. Vienna, 1842, Sept. 12. She received her education at the Vienna Conservatory and won her first success on the stage as Recha in *The Jewess.* She was at Gratz for a short engagement, and in 1868–82 was connected with the Royal Opera in Berlin; in 1876 and 1882 she assisted at the Wagner musical festivals at Bayreuth. After 1882 she made a number of tours and sang at the German Opera in New York for several seasons.

BRANDT, Max August Scipio von, German diplomatist: b. Berlin 1835, Oct. 8. He served for a short time in the army, but was sent on diplomatic business to the East in 1860 and was resident in Japan as German diplomatic representative (1862–75). From 1875 to 1893 he was German minister at Pekin. He has published *Aus dem Lande des Zopfes* (1894); *Die Zukunft Ostasiens* (1895); *Sittenbilder aus China* (1895).

BRANDT, Sebastian: 1458–1521: b. and d. Strasburg: author of a very popular German book, the *Narrenschiff*, or Ship of Fools. He studied law and the classics at Basel, where later he became one of the most approved lecturers. The Emperor Maximilian appointed him an imperial councilor. His Ship of Fools, a satire on the follies and vices of his times (Basel 1494), is not fine poetry, but is rich in good sense. It was translated into Latin by Locher (1497); and into English by Henry Watson, *The Grete Shyppe of Fooles of the Worlde* (1517); partly translated and partly imitated by Alexander Barclay, *The Shyp of Folys of the Worlde* (1508); and imitated by W. H. Ireland in the *Modern Ship of Fools* (1807).

BRANDY, n. *brăn'dĭ* [formerly *brandy-wine:* Ger. *branntwein,* burnt-wine: Dut. *brandwijn,* brandy—from *brandt,* burnt; *wijn,* wine]: spirit distilled from wine; any strong spirit from other liquors. Bran'died, a. *-dĭd,* strengthened with brandy. Brandy is a term sometimes applied generically to all kinds of ardent spirits, but usually restricted to the liquid obtained by distilling the fermented juice of the grape: see Distillation. The fermented liquors or wines employed for that purpose are various, and contain a proportion of alcohol (q.v.), which runs from 10 to 25 per cent. of their weight. The red wines generally are preferred, as containing most alcohol; but though they yield a larger amount of B. than the white wines, yet the latter afford a spirit which possesses a finer flavor and more agreeable taste. 1,000 gallons of wine give by distillation from 100 to 150 gallons of B., which varies in strength, but is generally diluted with water till it contains from 50 to 54 per cent. by weight of absolute alcohol When originally distilled, B. is clear and colorless, and if wished to remain so, is received and kept in glass vessels; but when placed in wooden casks, the spirit dissolves out the coloring-matter of the wood, and acquires a light sherry tint, which is deepened by burnt sugar and other coloring-matter, intentionally added. The aroma of

B. is due to the presence of more or less fusel oil (q.v.) accompanied by œnanthic ether (q.v.). The most famous B. is that distilled in Cognac, a dist. in the w. of France, from the choicest wines, but comparatively little of that sold under the name of *Cognac* comes from this district. A second-class B. is obtained from the red wines of Portugal, Spain, etc., as also from the refuse (*marc*) of the grapes left in the winepress, the scrapings of wine casks and vats, the deposits in wine-bottles, etc.; and very much of the B. sold as Cognac or genuine French B. is prepared at home from ordinary grain alcohol, by adding thereto Argol (q.v.), bruised French plums, some French wine-vinegar, a little good Cognac, and redistilling, when the spirit which passes over may be colored with burnt sugar, or by being kept in an empty sherry cask. Much preferable to these inferior decoctions is the B. produced in the United States from wines that are the product of American vineyards: this is readily obtainable pure. B. is the usual form in which alcohol is administered medicinally either internally or externally. It is distinguished from other ardent spirits by its light, cordial, and stomachic properties, and especially when set fire to for a minute or two, forming what is known as *Burnt B.*, it is valuable as a household remedy for diarrhea. B. is administered internally (1), in *mild cases of diarrhea*, unaccompanied by inflammation, but attended with griping pain, and the addition of nutmeg is productive of good; (2), as a *powerful excitant* for restoring patients who are suffering from suspended animation, and to relieve those who are laboring under fainting symptoms during an operation in surgery; (3), as a *stimulant and restorative*, where patients are much depressed in the ultimate stages of fever; and (4), as a *general stomachic stimulant* in indigestion after taking food, in the relief of flatulency and spasms of the stomach, and to check vomiting, especially in sea-sickness. In recent years it is not prescribed by physicians in so many cases as formerly. Externally B. is employed (1), in healing sores, and in stopping hemorrhage or the oozing out of blood from bruised or injured parts, and is generally applied by soaking linen or cotton with it, and laying the cloth on the part; and (2), in hardening the skin or cuticle over tender parts, the soles of feet which have been blistered, and the nipples of pregnant women for several days before delivery. The action of B. externally appears to be strictly chemical, as it coagualtes the albumen of blood and otherwise tends to solidify flesh tissue.

The value of brandy as a medicine depends upon the presence of ethers and other votlatile products; when adulterated and the amount of ethers reduced, brandy is almost valueless for medical purposes.

BRANDY STATION: on the Southern Railroad, Culpeper, Co., Va., about 56 miles southwest of Alexandria, the scene of many minor engagements of the civil war,

and notable for a cavalry engagement, 1863, June 9, between 7,900 Union cavalry, and 3,000 infantry under Gen. Pleasanton; and 10,200 Confederate cavalry, under J. E. B. Stuart, in which Pleasanton was defeated, losing 484 killed and wounded, and 382 missing. Stuart's loss was 485 killed, wounded and missing. At the time it was the greatest cavalry engagement of the war, and it marks the beginning of the Gettysburg campaign. It is known also as the battle of Beverly's Ford and Fleetwood.

BRAN'DYWINE CREEK: stream 36 m. in length, rising in Pennsylvania, and flowing through Delaware, entering Christiana Creek, about 2 m. above its confluence with the Delaware river, immediately below Wilmington. In the war of independence, a battle, in which the British had the advantage, was fought on its banks, 1777, Sep.

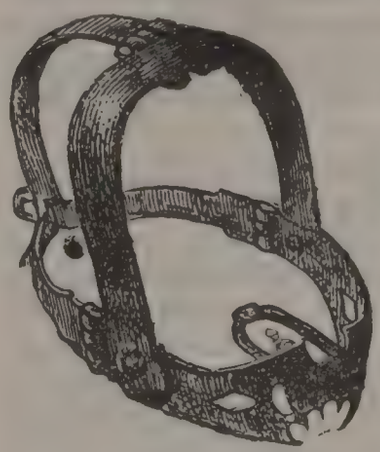
BRANFORD, *brăn'fẻrd:* borough of New Haven co. Conn., 8 m. s.e. of New Haven, on Long Island Sound, and on the New York, New Haven and Hartford R. R. Oyster fisheries, granite quarries, and the manufacture of locks and iron fittings represent the chief industries. The Blackstone Memorial Library is the principal building. As Totoket, B. was settled in 1643, later receiving its present name from Brentford, England. Pop. (1900) 2,473; (1910) 6,047.

BRANGLE, n. *brăng'gl* [F. *branler*, to shake: It. *branla*, a brawl: Gael. *brionglaid*, confusion]: a squabble; a wrangle; confusion: V. to wrangle. BRANGLING, imp. *brăng'gling.* BRANGLED, pp. *brăng'gld:* ADJ. confused; entangled.

BRANK, n. *brăngk* [L. *brance*, a Gallic name for a certain bread-corn]: buckwheat.

BRANK, or BRANKS, n. *brăngks* [Gael. *brangas*, an instrument formerly used for punishing scolds and slanderers; *brang*, a horse's halter: Ir. *brancas*, a halter]: in *Scot.* and *OE.*, a halter; a bridle having on each side a piece of wood joined to a halter; an instrument of iron for scolds and slanderers, surrounding the head, with a gag for the mouth—formerly used in England and Scotland as an instrument of punishment in place of the stocks. In England it was often called the 'scold's bridle.' It seems to have come in place of the ducking-stool or cucking-stool (q.v.). The B., in its simplest form, is a hoop of iron, opening by hinges at the sides, so as to inclose the head, and fastened by a staple with a padlock at the back; a plate within the front of the hoop projecting inward, so as to fit into the mouth of the culprit, and by pressing upon the tongue, be an effectual gag. There must have been difficulty in keeping such a hoop in its place; and so it received the addition of a curved band of iron, having a triangular opening for the nose, passing over the forehead, and so clasping the crown of the head that escape from it was scarcely possible. This may be regarded as the second form of the branks. In the third form, the

curved band was hinged in the middle, and, passing over the whole head, was locked into the staple at the back of the hoop. The next addition seems to have been a second band crossing the first at right angles, so as to clasp the sides of the head, and keep the B. still more firmly in its place. In its last most complicated shape, the B., by the multiplication of its hoops and bands, took the form of a conical cage or lantern, with a door behind opening by a hinge and fastened by a staple, the front being fashioned into a rude mask, with holes for mouth, nose, and eyes.



Branks.

When this curious instrument began to be used is unknown. It is found at Edinburgh 1567, at Glasgow 1574, also at Stirling 1600, and at Macclesfield, in Cheshire, 1623. The B. was used at Langholm, Dumfriesshire, 1772: it was used still more recently at Manchester and at Macclesfield.; and at Bolton-le-Moors in the 19th century perhaps as late as 1850.

BRANK'URSINE, or BRANC'URSINE: see ACANTHUS.

BRANNAN, *brăn'nan*, JOHN MILTON: military officer: 1819—1892, Dec. 17; b. in the District of Columbia. He graduated at the U. S. Milit. Acad. at West Point 1841, was engaged in the Canada border troubles 1841–2, and fought through the Mexican war, being severely wounded in the assault on the capital, and brevetted capt. He served on the frontier and against the Indians until 1861, when he was made brig.gen. U. S. vols. and was in command at Key West 1862. In 1863 he was in the Tennessee campaign, and was chief of artil. of the dept. of the Cumberland 1863, Oct. 10—1865, June 25. He fought at Missionary Ridge and in the Georgia campaign, and was present at the siege and surrender of Atlanta. He was brevetted maj.gen. U. S. vols. 1865, Jan. 23, and maj.gen. 1865, Mar. 13, for his services at Atlanta and through the war. He was mustered out of the volu. sevices 1866, May 3. He was made col. 4th artil. 1881, Mar. 15; and was retired 1882, April 19.

BRAN-NEW [a corruption of BRAND-NEW]: bright as a firebrand; quite fresh; just made.

BRANNY, a. *brăn'nĭ:* see BRAN.

BRANNING, n.: preparing cloth for dyeing by steeping in a vat of sour bran-water.

BRANT, JOSEPH (THAYENDANEGA): 1742–1807; b. on the banks of the Ohio: famous Indian, chief of the Mohawks. B. was grandson of one of the five sachems that

produced such a sensation at Queen Anne's court 1710. He was Gen. William Johnston's secretary during the French and Indian war, aided the English against the colonists during the revolution, taking part in the Cherry Valley massacre, and other bloody outrages. After the war he exerted his powerful influence to preserve peace, gained some education, became a consistent Christian, and assisted to publish the gospel of Mark and a prayer-book in the Mohawk language. Col. Stone, of New York, published a history of his life.

BRANTFORD, *brant'fėrd:* town, railway center, and port of entry, in Canada; cap. of Brant co., Ontario. It is 24 m. w. of Hamilton, on the Grand river, which, in connection with a canal of two and a half m. in length, gives B. water-communication with Lake Erie. Beside churches representing ten different denominations, it has banks, two daily and two weekly newspapers, a fine court-house, a widows' and orphans' home, and manufactures engines and machinery, agricultural implements, iron-castings, brass, tin, japanned ware, stone-ware, sashes, etc. The Grand Trunk railway station and shops occupy 11 acres. Pop. 16,700.

BRAS D'OR, *brâ dōr'* [Fr., arm of gold]: two *fiords* or channels, called the Big and the Little, about 25 miles long, opening from the Atlantic Ocean into a Little and a Big Bras d'Or Lake, in the island of Cape Breton, province of Nova Scotia. The larger channel is itself an ample harbor, and the lakes extend 50 miles. In a London admiralty map, 1776, these bodies of water are named Labrador, probably a mistake for *le bras d'or.* Labrador proper is a Spanish word, meaning laborer (perhaps referring to Indians carried away as slaves), though Weise derives it from the Portuguese for farmer; and a Basque whaler, named La Bradore is said to have given his name to Bradore Bay in Newfoundland. The scenery of Cape Breton is diversified; and Bras d'Or Lake, which is a magnificent inland sea of great breadth and depth, abounds with valuable fish. A canal, a half-mile in length, connects it on the south with St. Peter's Bay, completing an inland water-route through the heart of Cape Breton.

BRASENOSE, *brāz'nōz,* one of the colleges of Oxford Univ., sometimes called King's Hall and College of Brasenose. It was founded, 1509, by the joint benefaction of William Smith, Bp. of Lincoln, at one time chancellor of the univ., and Sir Richard Sutton, Knight of Prestbury, Cheshire. The original foundation was for a principal and twelve fellows. Eight fellowships were added by various benefactors, 1522–86. B. college is also very rich in scholarships and exhibitions. A nose in brass, curiously fashioned, is now conspicuous over the great gateway. Till lately, all the fellowships were confined to natives of certain counties. Many important changes were introduced in the 19th century. Five out of the twenty fellowships have been

suppressed, one being elevated to the endowment of a professorship, the remaining four to the establishment of additional scholarships. All the remaining fellowships have been thrown open. The number of names on the books is about 500; the number of resident undergraduates is considerably over 100.

BRASH, a. *brăsh* [Icel. *breyster*]: brittle, hasty, irascible.

BRASH, n. *brăsh* [from *brush:* Sp. *broza*, chips: Gael. *bruis*, splinters: F. *brosse*, bushy ground]: in many parts of England, a mass of broken and angular fragments derived from the subjacent rocks; called also *Shivers*, or *Blaze*, or *Rubble*. They occasionally form the basement bed of alluvial deposits. B. is applied also to broken fragments; refuse; boughs of trees. CORN-BRASH, in *geol.*, a division of lower oolite.

BRASH, n. *brăsh* [Gael. *brais*, a fit, a convulsion: infirm]: in *Scot.* and *prov. Eng.*, a fit of illness of any kind; an eruption on the skin; a sudden crash or development. WATER-BRASH: see under WATER.

BRASH: see PYROSIS.

BRASIDAS, *brăs'ĭ-dăs:* d. B.C. 422: bravest and most energetic Spartan general in the earlier years of the Peloponnesian war. Having distinguished himself (B.C. 431) by courage in relieving the town of Methone from a hostile attack, he was made one of the chief-magistrates of Sparta. In 424, he relieved Megara; and in his expedition to Macedonia, in the same year, to aid the states which had thrown off their allegiance to Athens, he was completely successful. In 422, B., who could obtain no reinforcements from Sparta, had to encounter with his helots and mercenaries the flower of the Athenian army under Cleon. A battle took place at Amphipolis, in which both Cleon and B. were killed, but the army of the former was completely beaten. B. was buried at Amphipolis, within the walls, and long after his death his memory was honored as that of a hero, by the celebration of yearly sacrifices and games. The Greek writers speak highly of B. Thucydides notices his eloquence, unusual in a Spartan, his justice, liberality, and wisdom, while Plato compares him to Achilles; but circumstances are not wanting to show that he was endowed with as much Spartan duplicity as Spartan courage.

BRASIL-WOOD: see BRAZIL-WOOD. BRASIL, n. *bră-zĭl*, a pigment.

BRASS, n. *brăs* [AS. *braes*, from being used in soldering: Icel. *bras*, solder; *brasa*, to be hardened by fire: Sw. *brasa*, to flame: It. *bronze*, burning coals; *bronzo*, Brass]: a compound of copper and zinc of a yellow color: OE. and slang for 'money.' BRAS'SES, n. plu. *-sĕz*, slabs or plates of brass on tombstones or monuments having engraved or raised figures on them, and inscriptions—much used in the middle ages. BRAS'SING, n. a coating of brass. BRASSY, a. *brăs'sĭ*, made of brass; like brass. BRAS'SINESS, a. *-sĭ-nĕs*, the quality or appearance of brass. BRASS-BAND,

an instrumental band. BRASS'FOIL, very thin beaten sheet brass, thinner than latten. It is also called Dutch gold. BRASSAGE, n. *brăs'saj*, a fine formerly levied to defray the expense of coinage.

BRASS, n. *brăs* [Gael. *bras*, rash, impudent; *braise*, rashness, impudence]: in *familiar slang*, impudence; shamelessness. BRAZEN-FACED, remarkably impudent. A FACE OF BRASS, a bold, impudent, set-one-at-defiance face —brass being taken as the symbol of impudence and self-will. *Note.*—This entry has been connected with the preceding one from an erroneous idea of its origin, and has taken its inflections from the same idea: for similar phrase see under BRAZE.

BRASS: an alloy of copper and zinc, largely used for household furnishings, certain parts of machinery, and various ornamental and useful articles. Technically, the term B. is extended to include compounds of copper and tin, as in *brass-ordnance*, the *brasses* or bearings of machinery, etc.; but such alloys of copper and tin, though styled *hard* B., are more strictly varieties of BRONZE (q.v.); this notice is confined to the alloys of copper and zinc, or *yellow* brass. In ancient history, biblical and profane, frequent allusions are made to the employment of B. for musical instruments, vessels, implements, ornaments, and even gates; but as no mention is made of its mode of manufacture, or even of its composition, it is doubtful if the B. of the ancients was composed of copper and zinc. In the manufacture of B. on the large scale, two parts by weight of copper to one part of zinc are used, the zinc being one-half the weight of the copper; but alloys are made for particular purposes with less or greater proportions of zinc. Thus, where a material of more than ordinary tenacity is required, the zinc is reduced to one-fourth the weight of the copper; and where an alloy of a hard and brittle nature, possessing little resisting power, is wished for, the zinc is increased to an amount equal with the copper, or greater. In the manufacture of B., either of two processes may be followed. The direct method is to fuse the zinc in a crucible, and gradually add the copper in pieces. But this process is attended with disadvantage, owing to the volatile and oxidizable nature of zinc. The indirect method of forming B. is generally followed: it consists in heating in crucibles or pots a mixture of calamine (carbonate of zinc, $ZnCO_3$). charcoal, and thin pieces of scrap or grain copper. The calamine (q.v.) is generally first calcined or roasted to expel any traces of sulphur, then mixed with one-fourth of its weight of charcoal, and this mixture introduced into the crucible, after which the metallic copper is diffused through the mixture by being beaten in with hammers or mallets. The proportions employed are 3 parts of the mixture of calamine and charcoal to 2 parts of copper; and when introduced into a furnace, and subjected for 5 to 24 hours to a white heat, the charcoal reduces the calamine and separates the zinc, which, combining with

the copper, forms 3 parts of B., containing about 2 of copper to 1 of zinc.

For ordinary purposes, B. is first cast into plates of about 100 lbs. weight, and ¼ to ½ inch thick, which can be readily broken up, remelted, and cast in a mold of any desirable shape or size. The crude casting so obtained is generally screwed to a turning-lathe, and turned and bored into the required form with iron tools. B. is largely used for door-handles, window-shutter knobs, gas fixtures, etc. For the proportion of copper and zinc in the alloys resembling B., known as *gilding metal, Mannheim gold, pinchbeck, bath metal, Bristol brass, Muntz sheathing metal, spelter solder,* and *Mosaic gold,* see ALLOY.

BRASSART, n. *brăs'ĕrt,* also BRASSARD, n. *brăs'ĕrd* [F. *brassard,* an armlet or bracelet—from *bras,* an arm—from L. *brachĭŭm,* an arm]: in *plate armor,* the piece extending from the elbow to the shoulder; an armlet or bracelet; a band worn round the arm by the Geneva or Red-Cross ambulance-men, or as a sign of mourning. Brachiale was the ancient name for B. When the front of the arm only was shielded, the pieces were called demi-brassarts.

BRASSES, SEPULCHRAL: large plates of brass, or of the mixed metal called *latten* or *laton,* inlaid on slabs of stone, and usually forming part of the pavement of a church. The figure of the person intended to be commemorated was generally represented either by the form of the brass itself, or by lines engraven on it; though frequently an ornamented or foliated cross, with other sacred emblems, was substituted for the figure. Nor was the practice of imbedding them in the pavement uniform, as we sometimes find them elevated on what were called altar-tombs. It has been ascertained that the incised lines on these B. were originally filled with some black resinous substance, and that in the case of armorial decorations and the like, the field or background was often cut out by the chisel, and filled with some species of coarse enamel, by which means the appropriate heraldic tinctures were produced. In England, the brass was usually of the form of the figure, the polished slab forming the ground, and the ornaments, arms, inscription, etc., were inserted each as a separate piece. On the continent of Europe where the metal was more abundant, the B. were one long unbroken surface, formed of plates soldered together, on which were engraved all the objects represented, the portions of the plate not so occupied being ornamented by elaborate flower-work. B. are known to have been used for monumental purposes from a very early period, though there are no existing traces of them in England previous to the middle of the 13th c. There is reason to think, that if not imported from France, they were at first executed by French artists. Latterly, the art gained place in England, and English B., like English architecture, acquired a distinctive national character. The oldest complete specimen in England is that on the monument of Sir John d'Aubernoun, at Stoke Dabernon,

d. 1277; probably the brass was executed shortly after that date. Next in antiquity are those of Sir Roger de Trumpington, d. 1289, and of Sir Richard de Buslingthorpe, 1290; the former at Trumpington in Cambridgeshire, the latter at Buslingthorpe in Lincolnshire. In addition to the interest which they possess from their age, these B. are remarkable as still unsurpassed in beauty of workmanship and in the spirit of the design. As regards the earliest English B., it is further worthy of note that they are so similar, both in design and execution, as to lead to the conjecture that they are the work of one artist; while from their differing in many respects from the B. executed on the continent at the same period, it seems that this artist, if not an Englishman, worked exclusively in that country. In the following century (1325), on the brass of Sir John de Creke, at Wesley Waterless, Cambridgeshire, the artist's mark is affixed by a stamp—regarded as a proof that his craft had attained importance, and that his services were frequently called into requisition. But in this case, as in every other, with one exception, the name of the artist has perished. The exceptional case is that of the brass which once covered the tomb of Bishop Philip, in the church of the Jacobins at Evreux, Normandy, where the inscription ended with the words 'Guillaume de Plalli me fecit.' Many of the B. executed in England in the 14th c. are probably Flemish; and in the churches at Bruges some remain which appear to be by the same hand with others which are found in England. There can be little question, indeed, that for this, as for most other departments of the arts, afterward successfully cultivated in England, that country was indebted to continental artists. Nor will it surprise those who know the results of recent archæological investigations in similar subjects, to learn that the artists of France and Flanders in their turn were debtors to those of the worn-out empire of the East. As in painting, sculpture, and architecture itself, so in the art of working in brass, the sparks of antique genius which smouldered in Byzantium were the means of kindling those which afterward burned so brightly in modern Europe. There are few subjects which have been more carefully illustrated in recent years than that of sepulchral brasses. Of engraved brasses there are not two hundred to be found on the continent. Rubbings of most of these have been made by Mr. Creeny for a work on the subject of foreign brasses. Of modern B, the most remarkable is that in the Cathedral at Cologne, engraved 1737, as a monument of the late archbishop.

BRASSEY, *brăs'sĭ*, Lady Anne: 1837–1887, Sept. 14, author; wife of Sir (now Lord) Thomas B.; daughter of John Allnutt. She lost her mother in infancy; and from the time that she could walk and talk, until her marriage, 1860, she was the inseparable companion of her father. As a girl she was one of the leading beauties of two London seasons. She was kind-hearted and charitable, and for her

interest and zeal manifested in St. John's Ambulance Assoc. was made *Dame Chevalière of the Order of St. John of Jerusalem.* Lady B. was an extensive traveller, sailing on almost every sea, and visiting every shore. Her style of writing is graceful, and her works are interesting. She published: *Voyage in the Sunbeam* (1877), her most popular works; *Sunshine and Storm in the East* (1878); *In the Trades, Tropics, and Roaring Forties* (1884), etc. She died and was buried in the Indian Ocean, 1,000 m. from land.

BRASSEY, THOMAS: 1805–70: English engineer and railroad contractor of great ability and enterprise; b. Baerton, Cheshire, Eng. After receiving an ordinary education, he was, at the age of 16 years, apprenticed to a surveyor, whom he succeeded in business. After building parts of the Grand Junction and the London and Southampton railways, he contracted 1840, in partnership with another, to build the railway from Paris to Rouen. In a few years he held under contract, in England and France, some ten railways, involving a capital of $180,000,000, and employing 75,000 men. In partnership with Betts and Peto, he now undertook the Grand Trunk of Canada, 1,100 m. in length, and including the great bridge at Montreal. His army of men were employed in nearly every part of Europe, South America, Australia, India, etc. B. amassed great wealth, but continued to be generous to the needy, and modest and simple in his taste and manners. Sir Arthur Helps wrote his Life (1872).

BRASSICA, n. *brăs'ĭ-kă* [L. *brassĭca;* W. *bresych,* cabbage—said to be in allusion to the bunchy top]: genus of plants of the nat. ord. *Cruciferæ* (q.v.), distinguished by a round and tapering 2-valved pod (*silique*), of which the valves have each only one straight dorsal rib and no lateral veins, the seeds globose, in one row in each valve, and the cotyledons (q.v.) conduplicate (folded laterally). The species are natives chiefly of the temperate and colder regions of the old world; several are British. A number of species are extensively cultivated, and are of great importance in an economical point of view, particularly the CABBAGE (q.v.) of which Kale, Borecole, Colewort, and different kinds of Greens, Savoy, Cauliflower, Broccoli, Brussels Sprouts, and Kohl Rabi are varieties; TURNIP (q.v.); RAPE (q.v.), (Colza, Coleseed), and NAVEW (q.v.). Among the British species is one, called Isle of Man Cabbage, or Wallflower Cabbage (*B. monensis*), which differs from all these, and in some measure departs from the strict generic character, in having the valves of the pod 3-nerved, and one or two seeds in its beak. It has deeply pinnatifid leaves. It is found on the sandy shores of the w. of Scotland, the Isle of Man, the n. of Ireland, etc. Sheep and oxen are very fond of it, and it has been suggested that it might be profitably cultivated for feeding cattle. Its peculiar adaptation to sandy soils ought to recommend it to attention. BRASSICA

OLERACEA, *ŏl'ėr-ā'sĕ-ă* [L. *olerācĕŭs*, herb-like]: the original species, whence all the varieties of cabbage, cauliflower, broccoli, and savoys have been obtained. BRASSYLIC ACID n. *brăs-ĭl'ĭk ăs'ĭd*, an organic acid of the oxalic acid series.

BRAST, v. *brăst* [see BURST]: in *OE.*, the pt. of *burst;* burst; broken.

BRAT, n. *brăt* [W. *brat*, a rag: Gael. *brat*, a cloth, a mantle—*lit.*, a clout]: a name given in reproach to a child; in *Scot.*, a child's bib; a large coarse apron; the rough or uneven scum or cream which rises on the surface of milk; the skin; the skin or clout on milk; the floatings of boiled whey.

BRATCHET, n. *brăch'ĕt* [Sp. *braco*, a pointer or setter dog: Prov. *brachet;* Ger. *bracke;* O. H. G. *braccho*, a hunting dog]: in *OE.*, a dog that follows the chase by scent; a slow hound; a female dog; a term of reproach. *Note.*—BRATCHET is probably only a diminutive of BRACH, which see.

BRATTICE, n. *brăt'tĭs* [OF. *bretesche*, a small wooden erection or outwork; Ger. *brett;* Dut. *berd*, a plank or board: Scot. *brettys*, a fortification: It. *bertesca*, a kind of rampart]: a fence or wall of boards in a coal-mine, or around dangerous machinery; a partition especially of plate iron or other material, dividing the main shaft of a mine into two passages to provide an upward and a downward ventilation; also spelled BRETTICE, BRETAGE.

BRATTLE, v. *brât'tl* [Icel. *bradr*, violent; an imitative word]: in *Scot.*, to make a clashing or clattering noise; to make a confused and harsh noise; in *OE.*, to thunder. BRATTLING, imp. *brăt'tlĭng:* N. a clattering confused noise; an uproar or tumult. BRATTLED, pp. *brăt'tld.*

BRATTLEBORO, *brăt'l-bŭr-rō:* town of Windham co., Vt., 119 m. w.n.w. of Boston, on the Connecticut river, a mile below the mouth of West river, and on the Central Vermont and Boston and Maine R. Rs. The town was first settled in 1724 at Fort Dummer by a garrison from Massachusetts. The settlement at Fort Dummer was the first permanent civilized settlement in Vermont. The town was chartered in 1753 and incorporated as a village in 1832. Its present form of government is by a board of three selectmen elected annually in March and five village bailiffs elected annually in May. It is situated among picturesque scenery and is a favorite residential and summer resort; its institutions include a public library, academy, and the State Asylum for the Insane. Organs, carriages, furniture, machinery and toys, are manufactured, and B. is the centre of the Vt. maple-sugar industry and of the commerce of the southwestern portions of the state. The city has several banks, many fine churches and an excellent system of high and graded schools. Pop. (1910) 7,541.

BRAUN, *brown*, AUGUST EMIL: 1809, Apr. 19—1856, Sep. 12: b. Gotha, Germany; eminent archeologist. He studied at Göttingen and Munich, where he made the

friendship of his teachers, Schelling and Gerhard; with the latter he went to Rome 1833, and in a short time was made librarian, and subsequently sec. to the Archæological Institute. B. wrote many valuable works on art in German, Italian, and English. Among these are: *Il Giudizio di Paride* (Paris, 1838); *Kunstvorstellungen des geflügelten Dionysus* (Munich, 1839); *Griechische Mythologie* (Hamburg and Gotha, 1850); *Griechische Götterlehre* (Gotha, 1851–55); *Vorschule der Kunstmythologie* (Gotha, 1854, with 100 copperplate engravings); translated into English by Mr. Grant; and an admirable guide-book, *Die Ruinen und Museen Roms* (Brunswick, 1854); translated into English, 1855. B. also executed numerous electrotype copies of ancient works of art.

BRAUN, Kaspar, German wood-engraver: b. Aschaffenburg, 1807; d. Munich, 1877, Oct. 29. He studied engraving in Munich and in Paris under Prévière. In Munich he founded, with Dessauer, a xylographic institute, which later became a school of engraving. In 1843 he, in association with Friedrich Schneider, founded the *Fliegende Blätter*. The chief works which Braun has illustrated are *Die Nibelungenlied;* the *Volkskalendre; Götz von Berlichingen;* and *Münchner Bilderbogen.*

BRAUN, Ludwig, German painter: b. Schwäbisch Hall, 1836, Sept. 23. He was educated at Munich and Paris, and a number of water colors of the Schleswig-Holstein war were the means of obtaining him a contract to paint a cycle of pictures illustrating the history of the family of the Count of Hunolstein. His favorite subjects are battle scenes, and he accompanied the Austrian army in the Danish war and the Germans in the Franco-Prussian war. Among his works are *The Capitulation of Sedan; The Entry of the German Army Into Paris;* and *The Germans in Versailleis.* He has also painted several very successful panoramas including *The Battle of Sedan; The Battle of Mars-la-Tour;* and the *Battle of Lützen.*

BRAUNITE, n. *brown'īt* [in honor of M. *Braun*, of Gotha]: an abundant ore of manganese; the sesquioxide of manganese, and protoxide, with 8 per cent. silica.

BRAUNSBERG, *browns'bĕrg:* walled town of e. Prussia, govt. of Königsberg, about 35 m. s.w. of the city of Königsberg. It is on the Passarge; contains a Rom. Cath. seminary and gymnasium; and has manufactories of woolen and linen, and considerable trade in yarn, grain, ship-timber, etc. Pop. (1903) 13,000.

BRAVO, int. *brâ'vō* [It., Sp. (see BRAVE)]: 'Excellent!' 'Well done!' Italian exclamation of praise; superlative from *Bravissimo!*—commonly used without distinction of number or gender; but the Italians say *bravo!* to a male singer or actor, *brava!* to a lady, and *bravi!* to a company of actors or singers: N, an assassin; a murderer for hire; the plural, *Bravi*, designated men in Italy, especially Venice, who could be produced to do any dangerous deed for money. The Italians also gave the name Bravi to those fanatics in the Turkish army, who after maddening themselves by opium, rushed upon the ranks of the enemy, and so met death. BRAVISSIMO, int. *brä-vĭs'sĭ-mō* [It. superl.]: excellently well done.

BRAVO, LEONARDO, *lā-ō-nâr'dō brâ'vō*, Mexican revolutionary patriot: b. near San Luis de Potosi, 1766; enlisted in the revolutionary cause, and died of prison fever, in the hands of the Spaniards, in the city of Mexico, in 1812. The Spanish commander had repeatedly offered him his liberty on condition of taking service in the royal army, but, though the fever caused by confinement in a filthy dungeon was wearing out his life, he steadily refused to save it on such conditions.

BRAVO, *brâ'vō*, NICHOLAS, Mexican statesman, son of Leonardo Bravo: b. Chilpanzingo, 1790; d. 1854, April 22. He participated in the revolution against Spain (1810–17), and later aided Iturbide in establishing a republic, and supported him until 1822, May 18, when Iturbide proclaimed himself emperor. To this step Bravo was opposed, and he contributed in no small degree to Iturbide's deposition. He again became a member of the provisional government which remained from 1822, April 1 till 1824, Oct. 10, when the federal constitution took effect, under which he was elected to be vice-president until 1829, April 1, Guadalupe Vittoria being president. The politics of Mexico had now become involved in a controversy in which the order of freemasons, divided into two parties, one known as the *Escoses* and the other as *Yorkinos*, contended at once for the Scotch and ancient York rituals, and the one for a centralized, and the other for a federal, form of government. Bravo was grand master of the Scotch division, and when the federal system prevailed he became a

leader of the opposition. Notwithstanding this, he had been elected vice-president; but when, on 1827, Dec. 23, the standard of revolt was raised at Otaviba, he became the head of the movement. The purpose of the *pronunciamiento* was to replace the actual members of the executive government with men of the *Escoses*, and to dismiss Mr. Poinsett, then United States minister in Mexico, who was charged with too actively favoring the other party. Bravo was defeated and expelled, but was recalled in 1830 by President Bustamente, and sent by him against the insurgent Guerrero, who was taken in arms and executed by Bravo's orders, 1833, Feb. 14. After this Bravo remained in retirement until July 1839, when, as president of the council, he was charged with the supreme administration of the government during an interim of a week. Again from 1842, Oct. 26, till 1843, March, he was substituted as president by Santa Anna, during his absence as dictator at the head of the army. For the last time he held executive power as temporary president from July 29 to 1846, Aug. 4, when he was deposed by a revolution. On the commencement of the war between Mexico and the United States, he took up arms in behalf of his country, and participated in the battle of Cerro Gordo. In the autumn of 1853 he was accused by the ministers of Santa Anna of having secretly joined Juan Alvarez in the insurrection he had set on foot; but he at once denied the accusation and declared that he had retired from public life forever.

BRAVO DEL NORTE, *brâ'vo dĕl nor'tā*, or Rio Grande, *rī'o grănd*, or *rē o grân'dā:* river emptying into the Gulf of Mexico, next in size to the Mississippi. It is politically important, being through its whole course the boundary between Texas and Mexico; while physically its mouth may be regarded as that point on the coast where Central America, in its geographical aspect, begins to taper toward the south. It rises in the Rocky Mountains, near lat. 38° n., long. 106° 30′ w.; and after a course of 1,800 m. in a generally s.e. direction, it enters the sea near lat. 25° n., long. 97° w. The commercial value of the river is not great, for besides being for the most part very shallow, it is here and there beset by rapids and sand-bars. Small steamers, however, have gone up as far as Kingsbury's Rapids, about one-fourth of the entire length of the stream.

BRAVURA, n. *bră-vô'ră* [Sp. courage, brag]: in music applied to a composition as well as a style of performance. As a composition, the Bravura is an air or song, with many difficult passages and divisions of notes, requiring great spirit and volubility of execution. The intention of merely astonishing by execution has brought this species of composition into undeserved discredit. The Bravura style came first from the Neapolitan school. Rossini, Bellini, etc., united the Bravura with the cantabile style; and instead of leaving the

embellishments to the taste of the singer, wrote the whole of the notes in the music.

BRAW, a. *braw* [Scot. see BRAVE]: handsome; well dressed. BRAWS, n. plu. *brawz*, articles of dress or personal ornaments. BRAWLY, ad. *braw'lĭ*, very well; perfectly.

BRAWL, n. *brawl* [F. *brailler*, to cry often: Dan. *bralle*, to talk much and high: W. *brawl*, a boast: comp. Gael. *braodhlach*, noise, discord]: a noisy quarrel; uproar: V. to quarrel noisily; to make an uproar; to sound as water flowing over a bed of shingle and gravel. BRAWL'ING, imp.: ADJ. noisy, quarrelsome; making the rough rattling sound of water flowing over a bed of shingle and gravel: N. the act of quarrelling; a disturbance. BRAWL'INGLY, ad. *-lĭ*. BRAWLED, pp. *brawld*. BRAWL'ER, n. one who.—SYN. of 'brawl, v.': to wrangle; contend; squabble;—of 'brawl, n.': noise; quarrel; uproar.

BRAWL, n. *brawl* [corruption of OF. *bransle*, a totter, a swing, a dance—from *bransler*, to shake, to totter]: in *OE.*, a sort of dance.

BRAWN, n. *brawn* [It. *brano*, a piece of flesh violently pulled away from the whole: O. H. G. *brâto;* Fris. *braede*, a lump of flesh: OF. *braion* or *braon*, muscular parts of the body: Gael, *bráin*, big, bulky—*lit.*, a rough lump of flesh]: the flesh of a boar prepared in a particular manner; the muscular part of the body; the arm; a cooked gelatine mass made from the boiling down of the head and belly-piece of a pig, with ox feet sometimes added to render it gelatinous. The whole is rolled up tight in sheet-tin, and boiled for four or five hours. The moisture is then well pressed out of it, and having been allowed to stand 10–12 hours, the meat is put into cold salt and water, and is then fit for use. BRAWN'Y, a. *-ĭ*, or BRAWNED, a. *brawnd*, muscular, fleshy; bulky. BRAWN'ER, n. a boar killed and dressed for the table. BRAWN'INESS, n. the quality of being brawny; strength.

BRAXY, or BRAKSIE, n. *brăk'sĭ;* also BRAXES, BRAXIT, BRACKS, BRAIK [Gael. *bragsaidh*, the braxy—from *braic*, the mouth]: a disease among sheep; the mutton of animals so affected, or that have died of sudden disease. The derivation of the word is uncertain. The vague way in which the term Braxy is used, renders it difficult to define the disease, for in different parts of the country, totally different disorders are included under this head. Of the two most generally recognized as Braxy, the one is an intestinal affection attended with obstinate diarrhea, the other is a blood disease, and the result of plethora or fulness of blood. The second, spoken of by the best informed shepherds as the true Braxy, may best be described here.

Causes.—A flock of very lean sheep placed on rich food is apt to be decimated by Braxy. By rich food is meant particularly substances abundant in nitrogenous

principles, such as luxuriant heather, strong and succulent grass, the best turnips, etc. Hilly land is favorable to the production of Braxy, from the firm nature and nutrient qualities of food growing on it. The disease appears in such situations in winter. About the month of November, many of the well-fed young sheep placed on turnips die suddenly from Braxy; and, again, when farmers resort to the forcing-system toward spring, the mortality is great, particularly when, in addition to much artificial food, sheep are allowed rich pasture. The mortality is greatest at the period of full moon, from the sheep grazing during the light nights as well as by day. The shepherd very frequently at these times finds one or two dead in the morning. Some assert that, in the winter, exposure induces Braxy; and it is possible that it may be produced by any sudden check to the exhalations, which tend so much to maintain the balance of the functions and purify the blood.

Symptoms.—The animal, in full health, suddenly ceases to eat, has a staring look, is peculiarly excitable, and separates itself from the flock. The head is lifted high, the breathing becomes labored, the countenance appears anxious, and the animal loses the power of its limbs. It totters, falls over, is seized with convulsions, and dies within five or six hours, and often within an hour from the first symptoms of the disease.

Cadaveric appearances.—If the sheep's throat is cut before it dies, the absence of any peculiar appearances within the body is very remarkable: the flesh appears of a dark-red color, and the veins are charged with dark blood, but, on the whole, the body of the sheep looks so well that the mountain-shepherd cuts it up to make 'braxy mutton.' If the sheep is allowed to die of itself, the body soon swells, putrefies, and is rendered useless.

Treatment.—The prevention of the disease alone affords hope, and it consists in regulating the animal's diet to prevent sudden transitions from low to rich keep; to mix food so as to modify the action of the more highly nitrogenized kinds; and to check the development of plethora or fulness of blood by saline purgatives and diuretics, such as Epsom and Glauber salts or nitre. The principles of prevention are the same as in the case of BLACK QUARTER (q.v.) in cattle. Shelter during severe winter weather is insisted on by shepherds as essential to prevent the malady.

BRAY, n. *brā* [OF. *braire*, to cry like an ass: Gr. *bracho*, I crash, I roar: Icel. *brak*, crash, noise: Dan. *brage*, to crash]: a loud harsh noise; the cry of an ass: V. to make a loud harsh noise like an ass. BRAY'ING, imp.: ADJ. making a loud harsh noise: N. a loud harsh noise as of an ass uttering its peculiar cry. BRAYED, pp. *brād*. BRAY'ER, n. one who; in *printing*, a wooden muller used on the ink-table to temper the ink.

BRAY, v. *brā* [Sp. *bregar*, to work up paste or dough: F. *broyer*, to bray—from OF. *breier;* Bret. *bræa*, to bray in a mortar: W. *breuan*, a mill: Gael. *brà* or *bradh*, a quern, a hand-mill]: to rub or grind down in a mortar; to pound; to grind small. BRAY'ING, imp. BRAYED, pp. *brād.*

BRAY, n. *brā:* in *OE.*, a cliff; a rising ground: see BRAE.

BRAY, *brā:* maritime town, Ireland, partly in the county of Dublin, partly in that of Wicklow, 13 m. s.e. from Dublin, with which it is connected by the Dublin Kingstown and Bray railway, and the Dublin Wicklow and Wexford railway. Some years since Bray was a small fishing village; but the beauty of its situation has made it a popular watering-place, as well as a favorite location for villa residences. The most striking buildings are the new hotels, and a Turkish bath, recently diverted to other purposes. The affairs of the municipality are administered by town commissioners. Bray has a weekly newspaper. Pop. 7,000.

BRAY, MRS. ANNA ELIZA: authoress: b. London, Eng. 1790, Dec. 25; d. 1883, Jan. 21; daughter of John Kempe, of the New Kent Road, Surrey, Eng. At an early age; she showed much imaginative faculty, and a taste for design, which brought her the acquaintance of Mr. Stothard, R.A. From him she took lessons in drawing; and, 1818, Feb., married his second son, Charles Alfred Stothard, also an artist, and author of a well-known work entitled *The Monumental Effigies of Great Britain, selected from our Cathedrals and Churches*, etc. In 1818, July, she accompanied her husband to France; and Mrs. Stothard wrote an account of her first foreign experiences, *Letters written during a Tour through Normandy, Brittany, and other parts of France, in 1818, with Numerous Engravings after Drawings by C. Stothard, F.S.A.* (Lond. 1820, 4to). Subsequently, Mrs. Stothard accompanied her husband on a similar tour of the Netherlands. In 1821, May, her husband died from the effects of a fall; and in 1823, she wrote *Memoirs, including Journals, Letters, Papers, and Antiquarian Tracts of the late C. A. Stothard, with Connective Notices of his Life, and some Account of a Journey in the Netherlands.* Distress of mind brought on ill health, and Mrs. Stothard suffered from an affection of the eyes, which compelled cessation of literary labor for more than two years. In 1825, she married the Rev. E. A. Bray, vicar of Tavistock; and in the following year published an historical romance entitled *De Foix.* Her second romance, *The White Hoods*, was published in 1828; followed by *The Protestant*, also 1828; *Fitz of Fitz-Ford, a Legend of Devon* (1830); *The Talba or Moor of Portugal* (1830); *Warleigh, or the Fatal Oak, a Legend of Devon* (1834); *Trelawny of Trelawne, or the Prophecy, a Legend of Cornwall*

(1837); *Trials of the Heart* (1839); *Henry De Pomeroy* (1842); and *Courtenay of Walreddon, a Romance of the West* (1844). A collective edition of all these romances was published in 10 vols. 1845. Her letters to Southey were published, and reached a second edition in 1879. Mrs. Bray was author, also, of *The Borders of the Tamar and the Tavy* (1836); *The Mountains and Lakes of Switzerland* (1841); *Trials of Domestic Life* (3 vols. 1848); *Life of Thomas Stothard, R.A.* (1851); *A Peep at the Pixies* (1854); and *Händel, his Life, Personal and Professional, with Thoughts on Sacred Music* (1857). In July 1857, Mrs. Bray's husband died; and in 1859, she published his *Poetical Remains.* In 1870, appeared *The Good St. Louis and his Times,* and *The Revolt of the Protestants of the Cevennes.* Her autobiography was edited by John A. Kempe 1884, in which year was published a revised edition, in 12 vols., of her novels and romances.

BRAY, THOMAS, D.D.: 1656–1730; b. Shropshire: English clergyman and writer. After receiving his education at Oxford, he was made rector of Sheldon; and upon the establishment of the Church of England in the colony of Maryland, he came to America to take direction of its affairs. He became much interested in foreign missions, and published, for their advancement, *Bibliotheca Parochialis* and a discourse on *Apostolical Charity.* Among his works were *Catechetical Lectures; Directorium Missionarium;* and *Martyrology; or Papal Usurpation.*

BRAYERA, also known as CUSSO or KOUSSO, a handsome ornamental tree of Abyssinia belonging to the rose family. Its scientific name is *Hagenia Abyssinica.* The leaflets number 6 to 12 to each leaf, and its stamens are in separate flowers from its pistils. The bunches of pistillate flowers, made into an infusion, are used in medicine for the expulsion of worms, especially the tape worm. The taste is bitter and unpleasant. The active principle is kosin, which is sometimes given by itself.

BRAYMAN, MASON, American soldier and lawyer: b. Buffalo, N. Y., 1813; d. 1895. He learned the printer's trade in early life, but took up the study of law and was admitted to the bar in 1836. Removing to Illinois he was employed by that State to settle the difficulties with the Mormons of Nauvoo, and secured their removal in 1844. He served in the Federal army during the Civil War, and at its close was brevetted major-general. He was territorial governor of Idaho 1876–81, and after the last named date practised his profession at Ripon, Wis., until his death.

BRAYMEN, n. *brā'mĕn* [from Scotch *bray,* the same as Scotch *brae* (q.v.)]: Scotch name applied to the inhabitants of the southern declivity of the Grampian hills.

BRAZE, v. *brāz* [F. *braser*, to solder: AS. *bræs*, brass, from being used in solder: Icel. *brasa*, to harden by fire, to solder iron—from *bras*, solder (see BRASS 1)]: to solder with brass; to harden to impudence. BRA'ZING, imp. BRAZED, pp. *brāzd*. BRAZEN, a. *brā'zĕn*, made of brass; impudent; shameless: V. to meet with bold impudence; to be impudent. BRAZENING, imp. *brā'zĕn-ĭng*. BRAZENED, pp. *brā'zĕnd*. BRA'ZENLY, ad. *-lĭ*. BRA'ZENNESS, n. BRA'ZEN-FACED [see BRASS 2]: remarkably impudent. BRA'ZEN-FACE, n. a bold, impudent person. BRAZIER, n. *brā'zhẽr*, a worker in brass; a pan for holding burning coals. TO BRAZEN IT OUT, to meet a conscious fault or crime in a bold, impudent manner. BRAZEN AGE, a degenerate age, characterized by selfishness, violence, and war; in *archeol.*, the period when brass began to be made use of. BRAZEN DISH, a standard measure by which other dishes are gauged, kept in certain mining districts under the charge of a proper officer. BRAZEN SEA, in Jewish antiquity, a huge vessel of brass or copper, oval shaped, with 12 oxen of like material for a pedestal. It stood in the priest's court of Solomon's temple, and was 10 cubits from brim to brim, 5 in height, and 30 in circumference. It held water for the ablutions of the priests before performing the service of the temple. *Note.*—BRAZE seems to be the softened spelling of BRASS, meaning primarily 'to harden by passing through the fire,' then 'to ornament with brass'; the entries BRAZIER, BRASS, and BRAZE have substantially the same etymologies; cross-references are introduced to render the distinctive meanings plainer, and show their connection.

BRAZIER, n. *brā zhẽr* [F. *braise*, glowing embers—from Sp. *brasa;* Port. *braza;* live coals, old Ger. *bras*, fire (see BRAZE, and BRAZIL-WOOD): pan for holding burning coals; one who works in brass. Also spelled BRASIER.

BRAZIL, *brâ-zēl':* republic in S. America; changed from the empire of Brazil 1889, Nov. 15; bounded n. by Columbia or New Grenada, Venezuela, and the Guianas, British, French, and Dutch; e. by the Atlantic; s. by Uruguay and the Argentine Confederation; and w. by Paraguay, Bolivia, Peru, and Ecuador. It extends from 4° n. lat. to 33° 41′ s. lat.; 3,219,000 sq. m., about 30,500 less than the United States. Its seaboard of about 4,000 m. projects into the Atlantic fully a thousand m. east of a direct line between its two n. and s. extremes.

Physically this country differs in many respects from most of the other political divisions of S. America. It knows nothing of the volcanoes and earthquakes of the Pacific coast; and with winds blowing constantly from the Atlantic coast, it is exempted from those droughts which are always blighting the slopes of the Andes. The river system, in the number and magnitude of its

constituents, is unequalled. The n.w. portion is literally interlaced with streams. Most of them flow northward, and finally merge in the Amazon (q.v.). This river enters the country from the w., and after a n.e. course from this point, of about 1,800 m. falls into the Atlantic near the equator. It is the most voluminous, if not the longest river in the world. Next is the San Francisco, which, after flowing n. for 800 m. turns e., and then s.e., falling into the sea in about 11° s. lat. In order of size follow the Negro and Madeira, both tributaries of the Amazon—the former flowing from the n.w. and the latter from the s.w. The other large rivers of this portion of the country are the Branco, a tributary of the Negro; the Tapajos and Xingu, large affluents of the Amazon; the Araguay, Tocantins, Maranhão, and Paranahiba. Along the southern coast, s. from the San Francisco, are the mouths of the following considerable rivers: Vasabaris, Itapicuru, Paraguassu, Doce, Parahiba do Sul, and many others. In the interior of the s. portion of the country are the large rivers Uruguay and Paraguay.

The highest mountains of Brazil extend n. and s. like the Andes, although several inferior ranges traverse the country in other directions. In the e. portions are two great parallel chains, the Serra do Mar and the Serra de Villarica. The most picturesque mountain range is the Serra do Mar, following the coast s.w. of Rio de Janeiro, and finally stretching into two great arms which ultimately grasp the Montes Yerbales of the Argentine Republic. In the Serra do Mar there are peaks reaching to a height of 7,800 ft. above the sea-level, but the loftiest mountains are w. of that chain. Here are the Itatiaiossú, with the highest summit in Brazil, 10,300 ft. It is in the n.w. portion of Rio de Janeiro.

Among the mineral productions are gold, silver, copper, iron, tin, chromate of lead, sulphide of zinc, bituminous coal, granite, limestone, porphyry, gypsum, diamonds, sapphires, emeralds, rubies, and topazes. Some of the diamonds are esteemed the finest stones known. The principal region where they are found is Minas, where the celebrated Serra do Frio mines are. The richest gold mines in the empire are in the vicinity of Ouro Preto, in the province of Minas Geraes. Silver is found in very many places, and is often mined with gold. Copper is mined in several provinces, and the industry is large. Coal is mined extensively in many places.

The climate in so large a country is necessarily much diversified. In the s. it is delightful, generally, the summers being cool and the winters mild. In the n. provinces heavy rains and violent storms are frequent, especially in the rainy season, from October to March. In the Amazon region the thermometer ranges from 68° to 98°. At Rio de Janeiro the average is 75°. The

BRAZIL
AND GUIANA.
SCALE OF STATUTE MILES.
100 200 300 400 500 600
Copyright, 1905, by Rand, McNally & Co.
Longitude West from Greenwich.
ATLANTIC OCEAN
PACIFIC OCEAN
EQUATOR
TROPIC OF CAPRICORN
VENEZUELA
COLOMBIA
ECUADOR
PERU
BOLIVIA
PARAGUAY
ARGENTINE REPUBLIC
URUGUAY
BRAZIL
GUIANA
BRITISH
DUTCH
FRENCH
ANDES MOUNTAINS
CARACAS
MARGARITA I.
Port of Spain
TRINIDAD I.
DELTA OF THE ORINOCO RIVER
Orinoco R.
BARIMA I.
Queenstown
GEORGETOWN
New Amsterdam
Burnside
PARAMARIBO
Galibi
Iracoubo
CAYENNE
Behague Pt.
Cunani
MARACA I.
MOUTH OF THE AMAZON R.
Macapa
Montalegre
Obidos
Santarem
Almeirim
Gurupa
Cameta
Braganca
Sao João
PARA OR BELEM
S. LUIZ OR MARANHAO
Alcantara
Parnahiba
Brejo
FORTALEZA OR CEARA
Aracati
Sobral
Macau
NATAL
Formosa
PARAHIBA
Goyanna
Olinda
PERNAMBUCO OR RECIFE
P. Calvo
MACEIO
Alagoas
Penedo
ARACAJU
Coite
Jacobina
Cachoeira
Abrances
BAHIA OR SAN SALVADOR
S. Jorge dos Ilheos
Sta. Cruz
Caravellas
Minas Novas
Diamantina
ITAMBE MT.
VICTORIA
Cabo Frio
RIO DE JANEIRO
Santos
S. PAULO
Parati
Paranagua
Antonina
CURITIBA
Passo do Yguassa
Itajahy
Desterro
Lages
Campinas
PORTO ALEGRE
LAKE DOS PATOS
Pelotas
Rio Grande do Sul
Laguna de la Mangueira
L. Merim
Colonia
MONTEVIDEO
Rio de la Plata
BUENOS AYRES
Cordova
SANTIAGO
Antofagasta
Tarija
Potosi
SUCRE
Oruro
Cochabamba
La Paz
Lake Titicaca
Tacna
Aullagas or Poopo L.
Trinidad
Santa Cruz
Matto Grosso
CUYABA
Diamantino
MATTO GROSSO PLATEAU
Marsh of Xarayes
Camapua
GOYAZ
Meia Ponte
Bomfim
Pilar
Porto Imperial
Arrayas
Palma
Carolina
Oeiras
Crato
Ico
Campo Major
Caxias
THEREZINA
S. Goncalo
Manaos or Barra do Rio Negro
Barcellos
Manicore
Borba
Crato
Quicia
Jurua
Tabatinga
Olivenca
Coary
Teffe
Ega
Balsamao
Ft. S. Antonio
Taguaralzinho
Grande Lake
BANANAL OR S. ANNA I.
UNEXPLORED
Amazon R.
Madeira R.
Purus R.
Negro R.
Tapajos R.
Xingu R.
Tocantins R.
Araguaya R.
Parnahiba R.
Francisco R.
Parana R.
Paraguay R.
Uruguay R.
Pilcomayo R.
Bermejo R.
Guapore River
Mamore R.
Beni R.
Madre de Dios R.
Jurua R.
Japura R.
Javari R.
Putumayo R.
Iça R.
Solimoens R.
Branco R.
Caqueta or Japura R.
Guaviare R.
Meta R.
Arauca R.
Apure R.
Maracaybo L.
MT. DUIDA
PARIMA MTS.
ACARAI MTS.
TUMUC HUMAC
SERRA GERAL
SERRA DOS PARECIS
S. DO RONCADOR
SERRA SEIADA
SERRA DA MANTIQUEIRA
CORDILHEIRA GRANDE
SERRA BORBOREMA
Asuncion
S. Maria
Uruguayana
Cacequy
Riopardo
S. Angelo
New Hamburg
S. Victoria
Palmeira
Castro
Apiahy
Pouso Alegre
Campanha
Barbacena
Marianna
OURO PRETO
Catas Altas
Formosa
Paracatu
Pouso Alto
Porto Real
Chagas
Barra
Joazeiro
Pilao Arcado
Urussuhy
Pernagua
Yuruna
Itaituba
Florenca
Cataract of Guayra
Pirapo
Jabu
Barbosas
Cucuhy
Tupinambaranas Island
Arroios
Niri

prevailing diseases are rheumatism, intermittent fever, consumption, and leprosy.

A large portion of Brazil is luxuriant with vegetation. Trees split for paling, in the neighborhood of Rio de Janeiro, often send forth shoots and branches immediately. In many portions of the Amazon valley the great trees destroy each other by their close crowding, and in the province of Moranhão the roots of plants stretch out with such firmness and such abundance from the shores of pools, that the pedestrian may be walking over the water supposing it to be solid ground. The vegetation of the coast is principally mangroves, whose seeds in this moist warmth begin to sprout before they drop to the ground. Farther back from the coast are graceful palms of many kinds. Farther inland still is an immense profusion of vegetation, awkwardly grouped together, and grotesquely intertwined and crossed. Cocoa-trees, the vanilla, different kinds of pepper, cinnamon, and cassia abound. In the more remote interior, and on the vast pampas or southern prairies, solitary myrtles, numerous varieties of pleasing fruits, and now and then a cactus and ipecacuanha, add variety. The forests abound in useful and ornamental trees. The cocoa-tree thrives on the sea-shore, and supplies an important item of commerce. The Brazil-wood is a valuable timber, and yields a fine dye. Other trees are the rosewood-tree, the trumpet-tree, the laurel, the soap-tree, the palm, and the india-rubber tree. The last named is tapped every day during the season, and furnishes one of the most valuable exports of the country. Other important products of the soil are coffee, sugar, cotton, manioc, tobacco, rice, maize, and spices. Most important of these as an export is coffee, of which $50,000,000 worth is shipped annually. Next in importance after coffee is india rubber, with an annual export worth over $20,000,000.

Of animal life there is an unparalleled variety and abundance. The plains are covered with horses and horned cattle, many of them wild; and large flocks of goats and sheep and herds of swine, are pastured there. Pumas, jaguars, deer, several native animals of the wolf family, sloths, opossums, porcupines, armadillos, peccaries, capibaras, monkeys of different kinds, and vampire bats are in great abundance. Of serpents, there are anacondas and other pythons, rattlesnakes and jararacas, and many others. Turtles abound in the Amazon, and tortoises and terrapin on the land. Of birds of prey, there are vultures, condors, eagles, hawks, and owls. Of birds of beautiful plumage there is an infinite variety, including many species of humming-birds, parrots, and cockatoos, and the brilliant toucan. Also, there are the oriole, the uraponga, and the rhea, a kind of ostrich. Of wading birds of fine plumage there are ducks, geese, pelicans, etc. The insects are beautiful,

brilliant, and abundant. Butterflies are dazzling in color. Enormous spiders abound. The scorpions and centipedes are formidable, but the bees are stingless. The rivers abound in fish.

The population of Brazil comprises a number of distinct races, and many mixed and blended types. In the sea-board region the Indian or aboriginal element has largely become merged in the European; but the people of the interior nearly all are savages. It is thought that, through all their differences in different regions, a common original can be traced, called the Tupi-Guavani. The mingling of the Portuguese with the natives has given rise to the Mamlucos, who early became known by their raids in the s. provinces. Negroes were imported from Africa, and have mixed with whites and natives to such a degree that mulattoes of all shades now form a large proportion of the population. The creoles, who call themselves Brazilerios, are nearly the equals of the Portuguese in mental and physical capacity.

Brazil was discovered in 1499 by Vicente Yañez Pinzon (q.v.) in the service of Spain. Next year the Portuguese expedition to the East Indies, commanded by Pedro Alvarez Cabral (q.v.), missed its course through adverse currents, and came to this coast; and Cabral took possession of the country in the name of Emanuel, his sovereign. Successful colonization by the Portuguese soon followed, notwithstanding the opposition of Spain and the rivalry of private adventurers from France, who sought the country for purposes of commerce. Soon, however, the Spaniards of Buenos Ayres, feeling that the complete command of their mighty river was necessary to them, colonized the left bank by founding Monte Video. But nearly 20 years earlier, Brazil had acquired more territory on the Amazon than it was to abandon on the Plata, having, 1509, wrested from France, then at war with Portugal, what may now be designated Brazilian Guiana. It was only in 1531 that the Portuguese, busy as they were in India, planted their first settlement here. In 1578 Brazil fell, with Portugal itself under the sway of Spain —a connection which, besides being essentially detrimental, speedily threw it as a prey into the hands of the Dutch Republic; and though Portugal regained its own independence in 1640, it was not until 1654 that the country was entirely recovered from the Hollanders. Thenceforward the colony entered on a new era. Supplanted in a great measure throughout the east by the Dutch, Portugal was now directing most of its attention to her possessions on either side of the Atlantic. About a century and a half later, a still more beneficial change —arising from the mother country's own disasters— was inaugurated in the colony. In 1808 under the pressure of French invasion the monarchy, in the persons of the royal family, was virtually transferred from

Portugal to Brazil—an event immediately followed by the opening of the ports to foreigners. As a remoter benefit, too, of an incident which had no parallel either in English or Spanish America, Brazil on shaking off, like its neighbors, the European yoke altogether, found a merely nominal revolution sufficient for its purpose; and since the transition period, 1821–25, this government, with subordinate institutions for local objects, secured to Brazil's 20 vast provinces comparative unity and peace until 1889. In 1815 the Portuguese king, John VI., raised Brazil to the rank of a kingdom. Returning to Portugal, 1820, he left his son, Dom Pedro, regent. Two years later the latter declared Brazil free and independent, and assumed the title of Emperor. In 1831 Dom Pedro I. abdicated and returned to Europe, leaving his son Dom Pedro, then only six years old, his successor. The country was under a regency until 1841, when the son was declared of age and crowned Dom Pedro II. He occupied the throne till overthrown by the revolution of 1889. Among the leading facts of his reign are a war with Paraguay, 1865; the opening of all important rivers to foreign commerce; the giving of subsidies to steamship companies; and the gradual abolition of slavery. The latter commenced 1871, Sep., by the passage of a law providing that after the date of the act all children of slave women should be considered free yet bound to serve the owners of their mothers for the term of 21 years; and that all slaves belonging to the state or the emperor's household should likewise be free. The same law also provided for an emancipation fund to be applied to the ransom of slaves owned by private persons. In 1888 the remainder of the slaves, estimated at 500,000, were freed, but without compensation to owners.

The constitution of Brazil, dated 1824, March 25, amended 1831, Aug., by the 'Acto Addicional,' established the legislative, the judicial, and the executive, as governmental powers—the last being vested in the emperor, who held in addition a 'moderating power' by his royal prerogative. The legislative power was vested for affairs of the empire in a general legislative assembly, and for provincial affairs in the provincial assemblies. The general legislative assembly consisted of two houses, the senate and the chamber of deputies, both elected by the people, but under different forms. Three candidates for each senatorship (for life) were chosen and nominated to the sovereign, who appointed one of the three. The senators, 60 in number, had to be 40 years of age, native born, and possessing an annual income not less than $800. Their yearly salary was $4,500. The 125 deputies were chosen for four years directly by the voters in districts; their annual income had to be not less than $400; their salaries were $3,000, with traveling expenses. Since 1881, Jan. 9, the election of senators and deputies was direct instead of indirect,

and voters were required to have an annual income of about $200. Minors, monks, and servants had no vote. All voters registered were required, under penalty, to vote. The annual sessions of the legislature began May 3, and continued four months, and at its opening and closing the two chambers sat together in general assembly for important business. Each house elected its own officers. The chamber of deputies had the initiative in the assessment of taxes, in matters concerning the army and navy, and in the choice of the sovereign should the latter act become necessary. The senate had cognizance of offenses by members of the imperial family, or by senators and deputies during the session, and might convoke the legislative assembly should the emperor fail to do so within two months after the period fixed by law. The sovereign held the executive power aided by his ministers and a state council. The ministers had the responsibility for checking treason, corruption, abuse of power, and all acts contrary to the constitution, or to the liberty, security, and prosperity of the citizen—a responsibility not to be evaded on the plea of orders from the sovereign. The executive functions—besides carrying into effect the measures passed by the legislature—consisted of the convocation of the ordinary meetings of the legislative assembly; the nomination of bishops, of governors of provinces, and of magistrates; the declaration of peace and war. The 'moderating power,' vested in the emperor—besides the selection of ministers and senators—extended to the calling of extraordinary legislative assemblies, a temporary veto on their action, the dissolving of the chamber of deputies, and the granting of amnesties and pardons. The ministry was in seven departments: war, foreign, interior, marine, finance, justice, and public works, agriculture and commerce. The ministers were assisted by a council of state, usually ex-ministers; it comprised 12 ordinary and 12 extraordinary members, all appointed in continuity by the emperor. The heir to the throne, when of age, was one of the council. Each province had its president, appointed by the central government, and its provincial legislature elected by the voters for two years. The provincial assemblies had jurisdiction on all local concerns.

By a sudden and comparatively bloodless revolution in Rio Janeiro, in which the army took the principal part, the monarchy was abolished and a republic proclaimed 1889, Nov. 15. A provisional govt. was formed consisting of Gen. Deodoro da Fonseca, pres. without portfolio; Aristide Loba, minister of the interior; Equintino Bocayura, minister of foreign affairs; Dr. Ruy Barboza, minister of finance; Campos Salles, minister of justice; Benjamin Constant, minister of war; Admiral Eduardo Vandenkolk, minister of marine; and Demitris Ribero, minister of agriculture.

The imperial ministry were forced to resign; and while the provisional govt. guaranteed ample protection of life and property to the imperial family, it compelled all its members to leave the country on a man-of-war Nov. 17. On the 19th the following temporary constitution was promulgated: (1) That a republic is proclaimed; (2) That the provinces of Brazil, united by federation, compose the United States of Brazil; (3) That each state shall form its own local government; (4) That each state send a representative to congress, which will soon be convened, and the final decision of which the provisional government awaits, pending which decision the governors of each state shall adopt means to maintain order and protect the rights of the citizens; (5) That in the meantime the nation's internal and external relations shall be represented by the provisional government. On the 21st a decree was issued establishing universal suffrage through the republic, and declaring that all Brazilians able to read and write were entitled to vote at elections for govt. officers. The govt. pledged itself to respect the Princess's matrimonial contract, and also the pensions conceded the poor by the deposed emperor; and agreed to give Dom Pedro an annual allowance in the civil list and a subsidy of $2,500,000. The two last agreements were subsequently cancelled. 1890, Jan. 7, a further decree abolished the state religion. It declared that the federal and confederate state authorities were prohibited from establishing any religion; that the privilege to exercise a religious cult according to their faith was given alike to representatives of all religious beliefs; that this liberty protected individuals, churches, associations, and institutions in which any religious acts might be performed; that the patronage, resources, and prerogatives of all institutions were immediately extinguished; that the right of all churches and religious orders to acquire and administer estates under the laws was recognized; and that the federal govt. would continue to provide for the ecclesiastical revenue and support of the actual *personelle* of the Rom. Cath. Church, and would subsidize for one year existing professorships in the seminaries, leaving to each state in the future the right to recognize the ministers of this and other religions without contravening the preceding provisions. It was also decreed that a general election for a constitutional assembly of one house only be held through the republic 1890, Sep. 15; that the assembly meet in the capital city Nov. 15 following; and that Nov. 15, the anniversary of the birth of the republic should be observed in the future as a national holiday. The formal recognition of the new republic by the United States occurred 1890, Jan. 29, when Pres. Harrison received the credentials of H. G. Ameral Valente as minister resident, and of Salvador Mendonca as envoy extraor-

dinary on a special mission to the United States. See PEDRO II. DE ALCANTARA.

The next president, 1894, Nov. 15, was Prudente de Moraes Barros. The third president, Dr. Manoel Ferraz de Campos Salles, was elected for the term beginning 1898, Nov. 15. His successor, Senor Francisco de Paula Rodrigues Alves, was inaugurated 1902, Nov. 15. Alphonso Penna, the present executive, acceded to the presidency 1906, Nov. 15.

The established religion of the empire was the Roman Catholic, but all others were tolerated 'with their domestic or private forms of worship, in buildings destined for this purpose, but without the exterior forms of temples.' No person could be persecuted for religious acts or motives. The Rom. Catholic clergy were maintained by the state. Funds, however, were voted also for the construction of chapels and for the subsistence of ministers of different religions. The bishops and all other ecclesiastical officers were, pending the confirmation of the Roman See, appointed by the emperor, and no ecclesiastical statute could be executed in the empire without the consent of the emperor or of the general assembly. Marriages of Protestants were respected as legal.

Public education is divided into three classes: primary, preparatory, and superior. Higher education is controlled by the central government. Primary instruction in the capital is under the charge of the general government, and in the provinces under the provincial assemblies.

Under the constitution the instruction given in public institutions is secular, gratuitous (in primary schools), and at the charge of the various states and municipalities. In some of the states primary instruction is compulsory. An excellent standard has been established in primary schools (except those of remote districts, which are decidedly inferior). Pupils are admitted to the first-grade schools from 7 to 13 years of age, and to the second-grade schools from 13 to 15 years of age. There are separate schools for girls, who are admitted to the first grade at the age of 8 years. The course of study in the first grade is: reading, writing, the Portuguese language, arithmetic as far as the rule of three, metric system, elements of geography and history (especially of Brazil), introductory lessons in physical science and natural history, moral and civic instruction, drawing, elements of music, gymnastics and military exercises, manual training for boys and needle-work for girls, and practical lessons in surveying. The number of primary schools in the republic was recently stated to be 7,017, and the number of pupils about 300,000. There are several hundred private schools. Secondary education is provided in the Gymnasio Nacional (two establishments thus named in the capital; course of study seven

years). National institutions for higher education are: two law schools (those of São Paulo and Pernambuco); two schools of medicine and pharmacy (at Rio Janeiro and Bahia); the polytechnic school at Rio Janeiro; the school of mines at Ouro Prieto in the state of Minas Geraes; military and naval schools; the National Academy of Fine Arts, Institute of Music, and Museum; and finally the National Library, containing an immense collection of books and maps, manuscripts, prints, and coins.

According to the latest statistics the peace strength of the army is as follows: 14,680 infantry; 5,576 cavalry; 4,216 artillery; 1,420 engineers, etc.; total 25,892. The 1st reserves numbered 30,400 and the 2d reserves 44,000, making the total war strength 100,292. The navy consists of 5 battleships of the 2d and 3d classes, 5 coast defense ships, 2 armored cruisers, 4 protected and 4 unprotected cruisers, 6 sea-going gunboats, 13 river gunboats, 22 torpedo boats, 13 ships for special service (transport, hospital, etc.) and 2 school and training ships. There were 420 officers and about 5,000 men.

Such manufactures as exist in the country are highly prosperous, but manufacturing has always been subordinate to agriculture and the chief articles of manufacture have been those used in connection with agricultural pursuits. Now, however, manufactures are becoming more important. The chief industries are the manufacture of textiles, cotton-spinning, weaving, sugar-refining, cigar-making, smelting and refining of metals, the manufacture of steam-engines and agricultural machinery, the tanning of leather and the working of hides, and the manufacture of smaller articles, such as boots and shoes, salt, straw hats, soap, paper, glass, brick, tiles, earthenware, calicoes, candles, beer, powder and dynamite, castor-oil, cotton-seed oil, tinware, furniture and cabinet ware, canned goods, flour, sulphuric acid, wax matches, etc. Shipbuilding is also carried on to some extent. In 1906 the exports of coffee to the United States amounted to 625,160,025 pounds, valued at $51,124,498. The total exports of india rubber to the United States in 1906 were 29,497,148 lbs., valued at $23,837,586. Tobacco, cotton, cacao, Brazil nuts, rice, sugar—these are some of the vegetable products. There is practically no limit to the number of agricultural enterprises that can be successfully carried on in the table-lands, the broad, open valleys, and the lowlands forming the basin of the Amazon. In the higher regions and mountains the mineral wealth of the republic is being developed. During the first seven months of 1901, 2,435,866 grams of gold, 37,915 tons of manganese, and precious stones to the value of 464 centos, were exported from the state of Minas Geraes. The iron-ore regions are situated within a zone of about 3,200 sq. m., from 3,000

to 5,000 ft. above the level of the sea, and about 310 m. from Rio Janeiro, which is the nearest port. The output of diamonds and carbons in the state of Bahia is of special interest. Prior to the discovery of the South African mines this was the greatest diamond-producing centre, and the Paranguacu district is the only place in the world where carbons are found of marketable size. An excellent statement is made by Señor Fontoura Xavier, consul-general of Brazil in New York, who enumerates the gems found in Goyaz, Matto Grosso, Paraná, Rio Grande do Sul, and San Paulo, as well as in the states mentioned above. Black diamonds, emeralds, sapphires, rubies, beryls, amethysts, garnets, opals, chalcedonies, sapphirines, agates, and cornelians are found, some of them in great abundance. 'One of the carboniferous basins of Brazil is in the state of Santa Catarina. In the state of Rio Grande do Sul there have been discovered four large outcrops of coal. Bitumen exists in nearly all of the states.' Native sulphur, nitrate, salt, sulphate of magnesia are also mentioned. The average annual value of the gold and diamonds exported is said to be about $7,400,000. In Rio Grande do Sul are copper mines, in Paraná quicksilver mines; galena and lead mines in widely separated regions.

The complete statistics of the import and export trade of Brazil for the year 1901 show the following results: Imports were valued at £19,702,758, exclusive of bullion; exports were £40,621,993. The imports from Great Britain formed 31.389 per cent. of the entire import trade; exports to the same country and its possessions, 12.951 per cent. of total export trade Imports from the United States amounted to £2,463,938; exports to the United States, £17,462,650, being 43.116 per cent. of the whole merchandise exported from Brazil. Imports from Germany were £1,868,751; exports to Germany, £6,014,812. France imported Brazilian goods to the value of £4,761,907. Argentina exported to Brazil merchandise of the value of £2,651,287. In 1904 the total imports were $129,930,000 and the exports were $191,849,000. The balance of trade in favor of Brazil is seen to depend chiefly upon the exchange of products with the United States. For the year ending 1906, June 30, the exports from Brazil to the United States were valued at $80,416,524, and the imports from the United States at $14,530,471. During the 35 years preceding 1907, the United States has purchased from Brazil goods to the amount of $2,165,433,957, and sold to her goods to the amount of only $361,503,467—the balance of trade in favor of Brazil for that period being $1,803,930,490, contributed by the United States alone.

The revenues of Brazil for the fiscal year 1903 were estimated at 40,967,942 *milreis* gold, and 248.018,000 *milreis* paper, and the expenditures at 41,399,062 *mil-*

reis gold, and 244,462,545 *milreis* paper. The gold *milreis* is valued at 54.6 cents in U. S. currency, so the annual revenues and expenditures of the government amount to about $150,000,000 in American money. According to the latest statistics the funded debt is £42,423,817, and the floating debts (including the 'internal' debt, the floating debt proper and the paper circulation) is $540,693,936 in U. S. currency.

Large deficits, which were owing mainly to public improvements, the Paraguayan war, and the great famine of 1881, caused the government to issue loans both at home and in Europe. There are heavy duties both on imports and on exports. Direct taxes are laid on land, house-rent, trades and occupations, and transfer of property.

In 1898 gold payments were suspended; the paper money in circulation amounted to 788,364 centos; the rate of exchange average 7 3–16; amount required for the redemption of the funding loan was 115,997 centos; Brazilian bonds were at 50 per cent. discount; the amount due on the 1897 loan was £1,122,083; treasury notes to the amount of 20,350 centos of reis were in circulation; the treasury owed 11,000 centos of reis to the Banco da Republica; £274,694 were due for war material. To meet these various debts there were in the treasury 5,500 centos, and £81,713 in the agency at London. In 1902 gold payments had been resumed; the paper money in circulation was reduced by 107,000 centos of reis; the rate of exchange was 12d.; the paper money in circulation, which formerly was worth only £23,500,000, had increased in value to £34,000,000; Brazilian bonds abroad were quoted 35 per cent. higher; the rest of the 1897 loan had been paid; not a single treasury bill was in circulation. There were £2,000,000 in cash in London, besides 1,000,000 in consols, and 12,000 centos deposited in the Banco da Republica.

Nearly the entire population of the republic is still found on a comparatively narrow strip of land extending southward along the Atlantic coast from Pará, below the mouth of the Amazon, to the line of Uruguay. In other words, the white people have clung to the fringe of the continent which their ancestors took possession of in the 16th c. in the fashion we shall presently describe; and no civilizing conquest and occupation of the interior, such as occurred in North America, have been effectively undertaken. Except along or comparatively near the coast, the Brazilian states have less than one inhabitant per square mile. The number of inhabitants in the entire country was estimated at 21,565,000 in 1900, distributed as follows among the 20 states of the republic, and including 750,000 for the federal district: Minas Geraes 4,277,000; Bahia 3,335,000; San Paulo 2,520,000; Pernambuco 2,089,000; Rio Grande do Sul 1,350,000; Rio de Janeiro 1,300,000; Ceara 1,000,000; Alagoas 781,000; Maranhao 660,000; Para

652,000; Parahyba 596,000; Sergipe 450,000; Piauhy 425,000; Rio Grande Norte 407,000; Santa Catharina 405,000; Parana 380,000; Goyaz 340,000; Amazonas 240,000; Espirito Santo 201,000; Matto Grosso 157,000.

There were 2,705,000 foreigners in Brazil, namely, Italians, 1,300,000; Portuguese, 800,000; Germans, 300,000; Spanish, 100,000; Poles, 80,000; French, 10,000; English, 5,000; North Americans, 500; other nationalities, 110,000.

Comparing the above figures with those given a decade earlier, we conclude that the estimate for 1900 is probably too high. The total population in 1890, including 600,000 uncivilized Indians, was stated to be only 14,333,915.

Bibliography.—Agassiz, *A Journey in Brazil* (1868); Bureau of Am. Republics, Washington, D. C., *Handbook of Brazil* (geographical sketch); Burton, *Explorations of Highlands of Brazil* (1869); Cardim, *Narrativa epistolar de una viagem* (Lisbon 1847); *Collecção das leis e decretos* (1827); Debidour *Le Brésil avant le XIX° siècle* (Nontran 1878); Dundonald (Earl of) *Narrative* (1859); *Empire of Brazil at Exhibition of 1876* (Rio de Janeiro 1876); Fletcher, *Brazil and the Brazilians* (1868); Graham, *Journal of a Voyage to Brazil* (1824); Handelmann, *Geschichte von Brasilien* (1860); Hartt, *Thayer Expedition . . . Geology and Physical Geography of Brazil* (1870); Henderson, *A History of Brazil* (1821); Heriate, *Descripcão do estado Maranhão, etc.* (Vienna 1874); Herndon and Gibbon, *Exploration of the Valley of the Amazon* (Washington Public Print., 1853–54); U. S. 32 Cong.-Senate, Exec. doc. No. 36; Homem de Mello *Integração da nacionaledade Brazilaira* (Rio de Janeiro 1895); Kidder and Fletcher, *Brazil and the Brazilians* (1857); Koster, *Travels in Brazil* (1817); La Grasserie, *Lois civiles du Brésil* (1897); Lery, *Reise in Brasilien* (Münster 1794); Lopes de Sousa, *Diario da navegação* (Lisboa 1839); Magalhaes de Gandova *Histoire de la Province de Sancta-Cruz* Ternaux-Compans' *Voyages, etc.* (1837–41); Moreira, *Agricultural Instructions for Those Who May Emigrate to Brazil* (1876); *Negociaciones entre la repub. orient. de Uruguay y el imp. de Brasil* (Rio de Janeiro 1858); Southey, *History of Brazil* (1810–19); Stade, *Captivity Among the Wild Tribes of Eastern Brazil* (Hakluyt Soc. 1874); *Statement submitted to the President of U. S. as arbitrator* (New York 1894); Todd, *Report on Voyage of U. S. S. Wilmington up the Amazon River* (Washington, Gov't Print., 1899); Varnhogen, *Examen de quelques points de l'histoire geographique* (1858); *Historia geral do Brazil* (Rio de Janeiro 1876); *Historia das lutas com os Hollendezes* (Lisbon 1872); Warren, *Para; or Scenes and Adventures on Banks of Amazon* (1851); Wied-Neuwied (Prince), *Travels in Brazil* (1820); Zeballos, *Argument for the Argentine Rep. Upon the Question*

With Brazil in Regard to Territory of Misiones (Washington 1894).

BRAZIL,' Ind., a city and county capital of Clay county, 16 m. n.e. of Terre Haute. It is an important railroad center and in its vicinity are rich mines of block coal. Inexhaustible deposits of clay and shales are also found here and the city contains manufactures of pumps, tiles, machinery, etc. Brazil was incorporated in 1873, is governed by a mayor, elected quadrennially, and a city council; has a public library and controls its own waterworks. Pop. (1910) 9,340.

BRAZIL, Island of: one of the many mythical islands which early cosmographers reported as existing in the Atlantic. In Mercator's Atlas, 16th c., the north Atlantic where there are really only a few islands, was represented as studded with them. After the discovery of America, geographers continued for some time in the belief that it was a part of Asia; and hence may have set down some pretended or improperly-reported discoveries as islands. Besides, imagination and fancy had free play in that credulous age. Brazil, which was named from the red wood of that name, was assigned to different places; on one map it was placed among the Azores, and at last obtained the name of Terceira.

BRAZIL CABBAGE, or Chou Caraïbe (*Caladium sagittifolium*, or *Xanthosoma sagittifolia*): plant of the nat. ord. *Araceæ*, nearly allied to Cocco (q.v.), and very similar to it, although it differs in having arrow-shaped, pointed leaves. It is supposed to be originally a native of tropical America, but is now in common cultivation throughout the tropics, not only the root being used for food like that of cocco, but also the leaves, boiled as greens. Both root and leaves are almost entirely destitute of the acridity generally characteristic of the order.

BRAZIL'IAN GRASS: incorrect popular name of a substance used in the manufacture of a very cheap kind of hats, known as Brazilian Grass hats, and also as *chip* hats. It consists of strips of the leaves of a palm, *Chamærops argentea*, imported for this manufacture, chiefly from Cuba. See Chamærops.

BRAZILIAN PLUM: see Hog Plum.

BRAZILIN, n. *brăz'il-ĭn:* substance found in Brazil-wood and Sapan-wood; it is colored red by any fixed alkali.

BRAZIL' NUTS; seeds of the *Bertholletia excelsa*, a majestic and beautiful tree of the nat. ord. *Lecythidaceæ* (q.v.). The tree grows to the height of 100 or 120 ft., and abounds on the banks of the Orinoco and in the n. of Brazil. It produces a round woody pericarp or seed-vessel, almost as large as a man's head, within which are many of the seeds or nuts. The

pericarp is very heavy and solid, requiring a blow of a sledge-hammer to break it; and at the time when this great fruit is ready to fall, it is dangerous to walk under the tree. The seeds, popularly called nuts, which they much resemble, are wrinkled and triangular, having a hard shell and a pure white kernel, which, when fresh, is very agreeable. They are exported chiefly from Para and French Guiana. They yield a large quantity of oil, which is good for burning. The nuts or seeds of the *Lecythis ollaris*, or POT TREE, are produced in a pericarp which resembles a rusty iron pot with a lid, the lid dropping off and letting the seeds out, which are oblong, grooved, and esteemed much superior to the common Brazil Nuts, but they have not yet become an article of commerce, as the tree grows chiefly in the interior of the country, whence the nuts are only occasionally sent to the coast.

BRAZIL-WOOD, n. *brā-zĭl'-* [Port. *braza*, glowing embers: OE. *brasil*, of a bright red: Sw. *brasa*, to blaze]: a name applied to various red-woods of commerce from Brazil, forming species of *Cæsălpĭn'ĭa*, ord. *Legūmĭnōsæ*, sub.-ord. *Cæsălpĭnĭĕæ;* a heavy wood of a red color, used in dyeing red; the *Cæsălpĭn'ĭa brāsĭlĭĕn'ses* produces a dye-wood, and timber for cabinet-work; *C. echinātă*, a species producing a dye-wood, and known as pernambuco-wood; logwood, which see. BRAZILIAN, a. *brā-zĭl'yan*, of or from Brazil. BRAZILETTO, n. *brăz'ĭl-lĕt'tō*, an inferior kind of brazil-wood; a general name of *Cæsălpĭnĭa*. BRAZILEIN, n. *brăz'ĭl-ē'ĭn*, the coloring matter of brazil-wood. BRAZIL NUTS, triangular-shaped nuts from Brazil having hard wrinkled shells, and pure-white kernels, forming the seeds of a large tree, the *Berthŏlētĭa excĕlsa*, or *nobĭlis*.

BRAZIL' WOOD: dark-red or yellowish-brown dye-wood, which forms a considerable article of export from Brazil, where some of the trees which yield it are very abundant. It is the produce of different species of *Cæsalpinia* (q.v.). The best kinds are those called Pernambuco Wood, All Saints' Wood, and St. Martha Wood. Much of the Brazil Wood of commerce is obtained from *Cæsalpinia Brasiliensis*, a tree which is a native of the West Indies, commonly growing in dry places and among rocks, and seldom exceeding 30 ft. in height. It has bipinnate leaves, with many smooth, obtuse, oblong leaflets, and no terminal leaflets, the flowers in pannicles, with downy stalks. The heart-wood alone is of any value. PERNAMBUCO WOOD is the produce of *Cæsalpinia echinata*, a prickly tree, with prickly pods, and of which the red and yellow flowers have a delicious smell resembling that of the lily of the valley. The sap-wood is extremely thick, and the valuable heart-wood bears a small proportion to the whole diameter of the stem. The Sappan Wood (q.v.) of the East Indies nearly approaches Brazil Wood in quality. It is the produce of

Cæsalpinia Sappan, a small, thorny tree. The BRAZILETTO WOOD, sometimes also called Brazil Wood, brought from the Antilles, is much inferior. *Cæsalpinia crista* probably yields some of the inferior West Indian Brazil Wood. It is to be noted that Brazil Wood does not take its name from Brazil, but is mentioned under the name *Braxilis* in documents much older than the discovery of America, the Sappan Wood of the East Indies being probably intended; and the name of the country, Brazil, is derived from this wood.

When freshly cut, the color of Brazil Wood is yellow, but becomes dark when exposed to light, air, moisture, etc. Formerly it was largely used in dyeing, but coal-tar dyes and other manufactured dyes have generally supplanted it. It is still used in ink-making.

BRAZING, or BRASS SOLDERING: process of uniting together two pieces of brass, two pieces of copper, or one of each, by means of a hard solder, partaking more or less of the composition and properties of ordinary *brass*. The edges or parts of metal to be joined are first filed bright, so as to be thoroughly clean, then there is strewed over the gap or crevice a mixture of the solder and borax. The solder employed varies in composition according to the kind of work, and may be rendered more fusible by the addition of a larger amount of zinc, but the general proportions are (1) 16 copper, 16 zinc, and 1 tin; (2) 12 brass, 4 zinc, and 3 tin; or (3) 18 brass, 3 zinc, and 2 tin. When the whole has been fused together, it is allowed to cool, and is then filed down to a coarse powder, in which state it is used. The borax is employed to form a glaze over the brightened surfaces, and thus prevent the oxidation of the metal, which would seriously interfere with brazing, and even stop the operation. An outward coating or layer of charcoal is likewise serviceable in the exclusion of the air during the brazing of large pieces of metal. Where a very high heat is required in the process, a little powdered glass is mixed with the borax. The mixture of solder and borax may be applied dry, but it is better to moisten it with water, and to lay it on the filed surfaces with a spoon. The whole is then gently heated, when the water evaporates and leaves a crust of borax and solder. The work may now be strongly heated before the blow-pipe, or over a clear fire, and at a bright-red heat the solder fuses and the zinc begins to burn with a pale-blue flame. At this stage, the solder *flushes* or becomes liquid enough to permeate the joint or crevice; but should it be tardy in acting thus, several slight taps will insure the proper result. The whole is now cooled, and toward the close, the articles may be introduced into cold water for rapid reduction in temperature. See SOLDER.

BRAZOS DE DIOS, *brâ'zōs dĕh dē'ōs:* river of Texas, the second, if not the first, in magnitude that flows

within the state. It runs toward the s.e., rising in the table-land of Bexar co. and falling into the Gulf of Mexico about 40 m. s.w. of Galveston. With a course of about 900 m., it is navigable at all times 40 m. from its mouth, and at seasons 300 m.

BRAZZA, *brât'sâ:* island in the Adriatic, belonging to Dalmatia, Austria; lat. 43°–44° n., long. 16°–17° e.; 170 sq. m. It is separated from the mainland by a channel of 8 or 10 m. in breadth. Its surface is mountainous, and extensively wooded; vines, yielding excellent wine, are grown in the valleys, and figs, saffron, almonds, and oil are produced in considerable quantities. Excellent building stone is found in the e. part. St. Pietro di Brazza is the chief town. Pop. 24,465.

BRAZZA, Pierre Paul François Camille, Count de Savorgnan, *brât'sâ, pē-ār pōl frân-swâ kâ-mĕl, sâ-vôr-nyân:* explorer: b. on ship-board off Rio de Janeiro, Brazil, 1852, Jan. 26; d. Dakar, French West Africa, 1905, Sept. 15. He was bred to the sea; entered the French Naval School 1875; became a naturalized Frenchman 1878; and becoming acquainted with the Marquis de Compiègne and his work of exploration in the Ogôoué region was commissioned by the minister of public instruction to continue the marquis's work. At the moment Stanley had finished his passage across Africa by following the course of the Congo river, Brazza with Dr. Ballay, a naval surgeon, and Alfred Marche, the naturalist, began ascending the Ogôoué. In 1878, Aug., he reached the village of Okanga, and made a treaty with the natives. He spent a part of 1879 in France, and toward the close of that year established a French station on the Congo. While Stanley was opening a road along the Congo in the interest of the Belgian scheme, Brazza discovered a nearer road to the Congo and one that avoided its cataracts, by striking inland from the French settlement of Gaboon till he reached the Alima river, a tributary of the Congo, only 70 m. from the coast. He built his road, sailed on the Alima to the Congo, took possession of the region in the name of France, and opened trading stations before Stanley had completed his road to the Congo. 1890, Apr. 14, Stanley charged Brazza with having received King Leopold's money and handing the results of his labors with it to France, though the French govt. had appropriated large sums for Brazza's work.

BREACH, n. *brēch* [AS. *brica;* Ger. *brechen,* to break; F. *brèche,* a breach or opening in a wall—from O. H. G. *brecha* a break (see Break)]: a gap or opening, as made by cannon or gun-powder; the act of breaking, or state of being broken; the breaking of a law, or the nonfulfilment of an agreement; a neglect of duty; a difference or quarrel: V. to make an opening or gap in anything; to make a breach, to leap from the water, as a

whale. BREACH'ING, imp.: ADJ. used for making breaches or openings, as cannon. BREACHED, pp. *brēcht*. BREACH'LESS, a. BREACHY, a.: likely to break through an enclosure; with many breaches. BREACH OF PRIVILEGE, anything in word or deed derogatory to the dignity of either house of parliament, of which each house is sole judge, and can punish or acquit at pleasure—or to the dignity of any legally organized body. BREACH OF PROMISE, a suit instituted in a court for damages by the injured individual, man or woman, for failure to perform a contract or promise of marriage. BREACH OF THE PEACE, an offense or disturbance against public order and decency. BREACH OF TRUST, a violation or betrayal of confidence by the misappropriation of funds, documents, or property held on behalf of others. BREACHING BATTERY, in *mil.*, two or more cannon protected by an earthen parapet, employed to break down or make openings in walls, etc., of fortified places.—SYN. of 'breach, n.': break; gap; chasm; rent; cleft; rift; fracture; break; aperture; infringement; infraction; contention; dispute; quarrel; difference; misunderstanding; separation; violation.

BREACH, in Law: a breaking or violation of a right or of an obligation or engagement legally binding; and in this sense it has numerous applications, of which the following are those more particularly treated in lawbooks:

BREACH OF ARRESTMENT, or of Attachment: see ARRESTMENT: ATTACHMENT: GARNISHEE.

BREACH OF CLOSE is any entry on another's land without lawful authority and is an injury, for satisfaction of which an action of trespass will lie to recover damages. It is called a trespass for breaking a man's *close*, because every man's land is, in the eye of the law, inclosed and set apart from his neighbor's; and that either by a visible and material fence, as one field is divided from another by a hedge; or by an invisible boundary, existing in the contemplation of the law, as when one man's land adjoins that of another in the same field. The liability to this injury attaches not only to the party himself trespassing, but also to trespass by his cattle. And the law gives the party injured a double remedy in this case, by permitting him to distrain the cattle till the owner shall make satisfaction, or else by leaving him to the ordinary remedy by action for the damage done.

But in some cases trespass is justifiable, or, rather the entry will not be considered a trespass; as where it is done in exercise of a right of way, a right of common, or the like; or upon land adjoining a public road when the road is impassable, doing as little damage as possible in the passing through; or where a man comes to demand or pay money payable on the particular land; or to execute, in a legal manner, the process of the law; or by the license of the plaintiff himself; or for imme-

diate abatement and removal of a nuisance on adjoining lands after due notice to the owner has been disregarded. Also, a man may justify entering into an inn or public house without leave of the owner first obtained; because when a man professes the keeping of an inn or public house, he thereby gives a general license to any person to enter his doors. So a landlord may justify entering to distrain for rent; and a reversioner to see if any waste be committed on the estate, for the apparent necessity of the thing; and it has been held that the common law warrants the hunting of ravenous beasts of prey, as badgers and foxes, in another man's land, if no greater damage be done than is necessary, because the destroying such creatures is said to be profitable to the public. But in cases where a man misdemeans himself, or makes an ill use of the authority with which the law intrusts him, he is accounted a trespasser *ab initio;* as if one comes into a tavern, and will not go out in a reasonable time, but remains there all night, contrary to the inclinations of the owner; such wrongful act is held to affect and have relation back even to his first entry, and make the whole a trespass. But a bare nonfeasance, as not paying for the wine that he calls for, will not make him a trespasser, for this is only a Breach of contract. See Blackstone and Stephen's *Com.* respecting 'civil injuries.' See CLOSE: BREAKING INCLOSURE: TRESPASS.

BREACH OF COVENANT is one of those civil injuries by which is most commonly meant a violation of a covenant or agreement contained in a deed of conveyance, either to do or omit to do something, and which Breach gives a right of action against the party who made the covenant and his representatives. It may also refer to the breach of other obligations under seal. See COVENANT.

BREACH OF CONTRACT is the violation of any obligation or legal engagement, for which, at law, damages may be recovered, according to the nature of the breach and character of the contract. See CONTRACT: DAMAGES: SPECIFIC PERFORMANCE: EQUITY, COURTS OF: CHANCERY, COURT OF.

BREACH OF DUTY may be legally defined as either the non-execution of an office, or the performance of it in such a way that the conditions on which it was undertaken are violated. Such misconduct may either violate the conditions of an express contract, or it may do violence to an implied engagement, not from the express determination of any court or the positive directions of any statute, but from natural reason and the just construction of law, which assumes and intends that every man has engaged to do what duty and justice require at his hands. And he must do this with integrity, diligence, and ordinary skill; and if, by his neglect, injury accrues to individuals, they have their remedy against

him in damages. See CONTRACT: DUTY: OBLIGATION: DAMAGES: EQUITY: PERFORMANCE OF CONTRACTS.

BREACH OF THE PEACE is an offense against the public tranquillity and safety, and is either felonious or not felonious; practically, any conduct that can be called 'disorderly.' See PEACE, OFFENSES AGAINST THE PUBLIC.

BREACH OF POUND is an indictable offense—the breaking any *Pound* (q.v.), or place where cattle or goods distrained are deposited, in order to rescue them. When once impounded, such goods or cattle were understood to be in the custody of the law, and an action for treble damages lay at common law for illegally taking them out of pound upon a distress for rent. See Stephen's *Com.*, vol. iii. See DISTRAINT: DISTRESS: POUND.

BREACH OF PROMISE TO MARRY: see PROMISE and MARRIAGE.

BREACH OF TRUST: see TRUST.

BREACH, in Siege-works: a gap in any of the defensive walls or gates of a city; and *breaching* is the operation by which the gap is produced, usually by the guns of the besiegers. *Breaching batteries* are employed, consisting of several pieces of ordnance, so chosen as to kind and size, and so placed as to distance, as to burst a hole through the defenses in the shortest practicable time. The greatest effect is produced by lodging the balls in two vertical lines, from the parapet of the wall downward, and in a horizontal line, connecting the lower ends of those vertical lines; and then overturning the mass of material thus loosened by an irresistible volley. When a hole has once been made, by thus knocking away the masonry or earthwork, the breaching is continued until the crumbling mass has so accumulated as to form a practicable slope, up which the storming party of the besiegers may run. See ASSAULT. During the Peninsular war there were some formidable examples of breaching. At Badajoz, 14,000 shot brought down 180 ft. of wall in 104 hours, from a distance of 450 yards. At Ciudad Rodrigo, 6,700 balls brought down 105 ft. of wall in 32 hours, from a distance of 560 yards. At St. Sebastian, 13,000 shot brought down 100 ft. of wall in 62 days, from a distance of 620 yards. It was calculated, from these and other instances, that 10,000 24-lb. shot, or 240,000 lb. of iron, will breach 100 ft. of wall from a distance of 500 yards—the wall being of fair average masonry, and the height and thickness a fair average of those used in fortified towns. It must be remembered, however, that this estimate was made before the days of rifled cannon and Armstrong guns; and, on the other hand, that the walls adverted to were not of granite.

BREAD, n. *brĕd* [Icel. *braud;* Ger. *brod;* AS. *breod*, bread: Gael. *brod*, the choice or best of a thing]: food in general; loaves; cakes or biscuits prepared from flour

of any kind of grain; sustenance. BREAD'LESS, a. without bread. BREAD'-CHIPPER, one who chips bread; a baker's servant; an under-butler. BREAD-CORN, the different kinds of grain of which bread is made. BREAD'-FRUIT, the fruit of a tree whose pulp resembles bread when baked; the fruit of the tree *Artōcârpus incīsa*, ord. *Morācĕæ*, native of Pacific islands. BREAD'-STUFF, corn, meal, or flour for bread. BREAD AND BUTTER, one's means of living, or worldly position. EAT OF ONE'S BREAD, to enjoy one's hospitality; to receive one's means of living from. BREAD'-WINNER, the member of a family who earns their means of subsistence.

BREAD: loaves, cakes, or biscuits prepared from flour or any grain. The earliest and most primitive way of making bread was to soak the grain in water, subject it to pressure, and then dry it by natural or artificial heat. An improvement upon this, was to pound or *bray* the grain in a mortar, or between two flat stones, before moistening and heating, and from this *braying* operation some etymologists suppose the word *bread* derived (as if *brayed*). A rather more elaborate bruising or grinding of the grain leads to such simple forms of bread as the *oat-cakes* of Scotland, prepared by moistening oatmeal (coarsely bruised oats) with water containing some common salt, kneading with the hands upon a baking-board, rolling the mass into a thin sheet, and ultimately heating before a good fire, or on an iron plate, called a girdle, suspended above the fire. In a similar manner, the barley-meal and pease-meal *bannocks* of Scotland are prepared and in the East Indies (especially the Punjab and Afghanistan), as well as in Scotland, flour is kneaded with water, and rolled into thin sheets, as *scones*. The *passover cakes* of the Israelites also were prepared in this way. A similar preparation of wheat-flour, but where the sheet of dough is made much thicker, forms the *dampers* of Australia. The Indian corn-meal, kneaded with water and heated, affords the *corn-bread* of America. The kinds of bread referred to above are designated *unleavened*, as no leaven has been added to the dough to excite fermentation. Even in the time of Moses, however, *leaven* was employed in making bread. It is probable that the Egyptians were the first to use leaven; that the secret afterward became known to the Greeks; and that the Greeks communicated the process to the Romans, who spread the invention far and wide in the northern countries during their campaigns.

The grain of wheat is generally employed in the manufacture of the better kinds of bread by the more advanced nations; though rye, barley, Indian corn, and rice also are extensively used. The average composition of the grain of wheat when dried, so as to evaporate

about 14 per cent. of moisture, is

Gluten and albumen	13½
Starch	54½
Gum, sugar, oil, and fibre	30
Saline matter	2

The proportion of these ingredients varies, however; and though the native country of wheat is unknown, yet in a large portion of the world, within the wheat zone (see WHEAT), the quality improves with southward travel. Thus, Scotch wheat is inferior to English, the latter to French, that to the Italian; and some of the finest wheat in the world is grown in Barbary and Egypt. However, wheat of unsurpassed quality is produced in the n.w. states of the Union. The principal constituents of wheat may be separated from each other without much difficulty. Thus, if wheat-flour be placed in a cloth bag with the mouth well closed, and the whole introduced into a basin of water, and pressed by the fingers for some time, the starch is squeezed through the cloth as a fine white powder, and the gluten is left in the cloth as a viscidor sticky substance. Again, if wheat-flour be burned on a porcelain plate on a fire, or oven, or gas-lamp, till it can burn no longer, it leaves behind a small amount of ash or saline matter.

Previous to being employed in the fabrication of bread, the grain of wheat undergoes the process of *grinding*, with the double object of reducing it to a fine state of division, and separating the more hard and indigestible parts. See MILL. During the grinding operations, the wheat, as it passes from grain to flour, nearly doubles its bulk. The products come from the dressing-machine divided into different qualities, a quarter of wheat yielding—

	Bushels.	Pecks
Fine flour	5	3
Second flour	0	2
Fine middlings	0	1
Coarse middlings	0	0½
Bran	3	0
Twentypenny	3	0
Pollard	2	0
	14	2½

In the making of bread, the finest flour is employed in making *firsts;* a coarser flour is made into *seconds;* and a still coarser into *thirds* or coarse bread. There is no bran in *firsts*, but a greater or less proportion of the finer bran in *seconds* and *thirds.* In the making of good bread, three things are absolutely requisite: flour or meal, yeast or leaven, and water containing salt. The yeast (q.v.), or leaven (q.v.), is added to give a start to the fermentation (q.v.) process, thereby supplying carbonic acid, which communicates a spongy or light texture to the bread. Leaven is the more primitive ferment, and is simply a portion of moistened flour or dough in which the fermentative agencies have begun to work. It may be procured by allowing moistened flour to lie in a

warm apartment (summer heat) for six or eight days, and when sufficiently formed, has an acid taste and reaction, and a somewhat fusty odor. When brought in contact with a new portion of flour and water, and incorporated therewith by kneading, it very quickly acts as a ferment, and develops partial fermentation in the whole. Hence it is that where leaven is used, it is customary to retain a portion of the leavened dough for the next baking. On the continent of Europe leaven is still extensively employed, especially in districts far from breweries. In Britain and America, yeast is generally used as the ferment.

The materials being at hand, and the proper benches, utensils, and oven within reach, the baker takes a quantity of water and adds to it the yeast and salt; after which the flour is added, and the whole thoroughly and laboriously kneaded together till it assumes a ropy consistence. It is then called the *sponge*, and is placed in a kneading-trough in a warm place, which is styled *setting the sponge*. In a short time, the yeast begins to act on the gluten, starch, and sugar of the flour, compelling the latter to pass into alcohol and carbonic acid gas in every part of the dough, which thereby becomes inflated with innumerable air cavities. When the fermentation has sufficiently advanced, the baker takes the sponge, adds more flour, water, and salt, and a second time subjects the whole to a thorough process of kneading, to prevent portions being so far fermented as to become *sad*, and again allows the mass to lie in a warm place for a few hours. The dough swells considerably from distension by gas, and is weighed out into lumps of the proper size, which are shaped into loaves, constituting the *batch*, or placed in tin pans, and are allowed to lie for a short time till they become further distended. The oven has previously been heated by flues, by heated air or steam, or by wood being burned within it, to a temperature of at least 320° F., which is the lowest temperature at which bread can be baked, and ranging up to 572° F.; and when it has been thoroughly cleaned out, the loaves are introduced and placed on the floor, and the oven shut up. The heat acts in dissipating much of the water from the dough, in distending the air cavities more fully, and in partially *boiling* the starch and gluten of the dough, and developing some gum from the starch. Indeed, though the temperature of the oven is much higher, yet the loaves beyond the mere crust are bathed in an atmosphere of steam, and are never heated above 212°, as has been proved by direct experiments with the thermometer. One effect of the heat is to arrest any further fermentation (q.v.; see also YEAST). After several hours' baking in the oven, the length of time being determined by the temperature, the loaves are withdrawn, and allowed to cool. The brown appearance of the crust of loaves, and the pleasant taste of the crusts, are due to the action of the

heat on the starch and the formation of dextrine (q.v.), a sort of gum. The number of quartern (4 lb.) loaves which a sack of flour weighing 280 lbs. yields, is 90. It is apparent, therefore, that as 280 lbs. of flour yield 360 lbs. of bread, that a good deal more water must be present in the latter than in the former; and, indeed, ordinary good wheaten bread contains about 45 per cent. of water. This water is retained even after the loaf is apparently dry, and even mealy, as the gum and gluten have a great affinity for water.

Improvements in the process of making bread are occasionally effected. Thus a form of yeast, called German barm or yeast (q.v.), has been introduced, which is more cleanly than ordinary yeast or leaven, but appears to be too rapid in its power of causing fermentation to be manipulated easily in the making of ordinary loaves, though it does well for pan-loaves and fancy bread in general. Instead of raising the dough by the action of yeast, which decomposes a part of the flour and causes the loss of about 2 per cent., bicarbonate of soda and hydrochloric acid are sometimes employed. The proportions by this process are 4 lbs. of flour intimately mixed with 320 grains of bicarbonate of soda; to this is added a mixture of 300 grains of common salt in 35 ounces of water and 6½ fluid drachms of hydrochloric acid, sp. gr. 1.16, and the whole is kneaded and placed in the oven. When the mixture is made, the acid acts on the bicarbonate of soda forming common salt, which is left in the dough; and carbonic acid is liberated at every point, and communicates a spongy texture to the dough. A disadvantage attendant on this mode of raising the dough is, that it is apt to leave too much common salt in the bread. This is obviated by using water charged with carbonic acid: see AËRATED BREAD. Sesquicarbonate of ammonia is employed to some extent in the preparation of rusks, ginger bread, and other light fancy bread; when heated, it entirely passes into gas, and thus yields a very spongy mass. *Short-bread* is prepared from flour which has been incorporated with butter. See UNFERMENTED BREAD.

The appearance which good wheaten bread ought to present, is that of a vesicular or spongy mass, from which layers can be readily detached; and this, known to bakers as *piled bread*, is the best index of good, wholesome and easily-digested bread. When the layers cannot be detached, and the loaf cannot be crumbled down by the fingers into a coarse powder, or the fragments be thoroughly soaked and be readily diffused through water, but become a permanent tough mass of dough, the bread is imperfectly made.

Rye bread is very extensively used in n. European countries, where the soil being sandy is admirably adapted for the growth of rye. It yields a flour darker than wheat-flour. It is almost equal in nutritive value to wheaten-bread. Barley and oats, the bread from

which is made usually into cakes or bannocks, possess a composition not unlike wheat. Indian corn, which thrives luxuriantly on the American soil and is largely used here for bread, as also to a considerable extent in the old world, differs little from wheat in the proportion of its ingredients. Rice is occasionally employed in making bread, but it is not nearly so nutritious as wheat.

But though, with the exception of rice, the various kinds of grain do not sensibly differ in the amount of nutritious matter contained in the meal, yet there is great difference as to the quality of yielding a light, spongy bread. In this respect, the flour of wheat excels all others. This quality seems to depend upon the mechanical structure of the gluten of wheat, which gives a glutinous, sticky consistency to the dough, rendering it impervious to the carbonic acid gas formed in it during the fermentation, so that the gas thus imprisoned swells it up. The meal of other grains forms a more granular and less tenacious dough, which allows the gas to escape with more or less ease as it is formed. It is thus impossible to make a light, spongy loaf of oatmeal, however finely it might be ground. In the case of whole-meal bread or brown bread, the rough, hard particles of the bran interfere with the ordinary tenacious quality of wheaten-flour, and make the dough slightly porous, so that much of the gas escapes, and thus this kind of bread is never so much raised as bread of fine flour.

Brown, Composition, or Whole Flour Bread is made from the ground but undressed wheat, and therefore contains the bran as well as the flour. Some years ago it was suggested, that as the bran contained more nitrogenized matter than the flour, the whole meal must be more nutritious than the finer flour alone. But that opinion is now considerably modified; for while it is true that the whole meal (bran and fine flour) contains chemically more nutritive matter than the fine flour alone, yet the gritty particles that are present in the former cause an unnatural irritation in the alimentary canal, and lead to a quicker evacuation of the partially digested and absorbed food.

The *adulterations* of bread are various. Very commonly boiled potatoes are added to the flour and water in the making of the dough, and some consider that this yields a lighter and more palatable bread. It must be remembered, however, that the addition of any substance of a nature foreign to the composition of any material is an adulteration (see next article); and that, though potatoes may be supposed to improve the bread, yet good bread can be made without them, and the addition of the potatoes lessens the nutritive value of the wheat-flour. Alum is occasionally added to the dough to increase the whiteness and improve the general texture of the bread; and this it appears to do by arresting the passage of the starch into gum and sugar, which tends to take

place during the process of baking; and in Belgium, sulphate of copper is often used for a similar purpose. But these and similar admixtures are not only destructive of the nutritive value of a certain part of the bread, but are also positively injurious in their effects on the animal system. For the nutritive qualities of bread see NUTRITION: FOOD.

The *law* on the subject of bread is precise and strict in Britain as regards ingredients, weight, and manner of sale. Adulteration, or any sale of one kind of bread under pretense of selling another, are vigorously dealt with. In this country, the laws vary in different states; but in none do they approach the precision and strictness of the British statutes.

BREAD, ARMY: in camps and in barracks of any size, baked on the spot by bakers of the proper sub-department of supplies. Though perhaps a little rough in its manufacture, the article supplied is made from the best ingredients, and is genuine and wholesome. On a march, the bakeries supply bread at the several halting-places. In smaller barracks, bread is often obtained by contract, under supervision of the proper officials.

BREAD'-FRUIT TREE (*Artocarpus incisa*): tree of the nat. ord. *Artocarpaceæ* (q.v.), native of the islands of the Pacific Ocean and of the Indian archipelago—one of the most important gifts of nature to the inhabitants of these regions, its fruit supplying their principal food, and its inner bark a considerable part of their clothing, while its timber and its milky juice also are used for economical purposes. The genus to which it belongs (*Artocarpus*, Gr., Bread-fruit) is distinguished by having the male flowers in catkins, with a two-leaved perianth and one stamen; the female flowers naked; the fruit roundish, fleshy, and tuberculated. The Bread Tree is a rather slender tree, 40–50 ft. high, often rising almost half its height without a branch. It has large, pinnatifid leaves, frequently 12–18 inches long, dark green, and glossy. The fruit is generally oval, or nearly spherical, about the size of a child's head. It is a *sorosis*, a compound or aggregate fruit formed from numerous flowers on a common axis, and is covered with a roughish rind, which is marked with small square or lozenge-shaped divisions, having each a small elevation in the center; is at first green; when imperfectly ripened, brown; and when fully ripe, assumes a rich yellow hue. It is attached to the small branches of the tree by a short thick stalk, and hangs either singly or in clusters of two or three together. It contains a somewhat fibrous pulp, which, when ripe, becomes juicy and yellow, but has then a rotten taste. At an earlier stage, when the fruit is gathered for use, the pulp is white and mealy, and of a consistence resembling that of new bread. In a still less mature state, the fruit contains a tenacious white milk. The common practice in the South Sea

Islands is to cut each fruit into three or four pieces, and take out the core; then to place heated stones in the bottom of a hole dug in the earth; to cover them with green leaves, and upon this to place a layer of the fruit, then stones, leaves, and fruit alternately, till the hole is nearly filled, when leaves and earth to the depth of several inches are spread over all. In rather more than half an hour, the bread-fruit is ready; 'the outsides are, in general, nicely browned, and the inner part, presents a white or yellowish cellular pulpy substance, in appearance slightly resembling the crumb of a wheaten loaf.' It has little taste, but is frequently sweetish, and more resembles the plantain than bread made of wheat flour. It is slightly astringent, and highly nutritious. Sometimes the inhabitants of a district join to make a prodigious oven—a pit 20 or 30 ft. in circumference, the stones in which are heated by wood burned in it, and many hundred bread-fruits are thrown in, and cooked at once. Baked in this manner, bread-fruit will keep good for several weeks. Another mode of preserving it is by subjecting it in heaps to a slight degree of fermentation, and beating it into a kind of paste, which, although rather sour, is much used when fresh bread-fruit cannot be obtained. There are numerous varieties of the Bread Tree in the South Sea Islands, and they ripen at different seasons. The tree produces two, sometimes three, crops a year. In the West Indies and South America, into which the bread-fruit has been introduced, it has not come much into use as ordinary food; but various preparations of it are reckoned delicacies.

The fibrous inner bark of young bread-fruit trees, beaten and prepared, is used for making a kind of cloth, much worn by the common people in the South Sea Islands, though inferior in softness and whiteness to that made from the paper mulberry (see MULBERRY, PAPER).—There exudes from the bark of the Bread Tree, when punctured, a thick mucilaginous fluid, which hardens by exposure to the air, and is used, when boiled with cocoa-nut oil, for making the seams of canoes, pails, etc., water-tight, and as bird-lime. The timber is soft and light, of a rich yellow color, and assumes, when exposed to air, the appearance of mahogany. It is used for canoes, house-building, furniture, and many other purposes. It is durable when not exposed to the weather. The Jack (q.v.) or Jaca (*A. intergrifolia*), and the DEPHAL (*A. Lakoocha*), both large East Indian trees, belong to the same genus with the bread-fruit tree.

BREAD'-NUT: fruit of *Brosimum alicastrum*, a tree of the nat. ord. *Artocarpaceæ*, therefore allied to the bread-fruit; native of Jamaica. The genus *Brosimum* is distinguished by male and female flowers on separate trees, in globose catkins, with peltate (shield-like) scales for perianth, and the fruit a one-seeded drupe. The Bread Tree has ovate-lanceolate evergreen leaves; it

abounds in a tenacious gummy milk. Its leaves and young shoots are much eaten by cattle, but deleterious qualities are developed in them as they become old. The nuts boiled or roasted are an agreeable food, eaten instead of bread. Their taste resembles that of hazel nuts. To this genus the *Palo de Vaca*, or COW TREE (q.v.), of Demerara is supposed to belong.

BREAD RIOT IN NEW YORK, THE: a riotous demonstration in New York, 1837, Feb. 13. The financial policy of President Jackson had created an era of wild-cat banks, currency inflation, extravagant speculation, and high prices which bore cruelly on the poor, flour being $12 a barrel, partly owing to a short crop the year before, and other prices in proportion. In New York the general distress was intensified by the great fire of 1835, Dec. 15–16, which destroyed nearly 700 business and other buildings, covering some 13 acres in the heart of the city and occasioning a loss of $20,000,000. For some time the Jacksonian press had been denouncing the grain dealers as the cause of the famine prices, mentioning especially Eli Hart, the leading commission merchant, and the houses of Meech and Herrick, although as they were commission dealers their stocks were obviously not private hoards. On 1837, Feb. 13, just before Jackson's term expired, these papers announced a public meeting in City Hall Park at 4 P.M., the call being headed 'Bread, Meat, Rent, Fuel! Their prices must come down!' The call was signed by eight men, two of whom—Moses Jacques and Alexander Ming, Jr.—were well-known and very violent demagogues. Jacques was made chairman, and with Ming, and others, made furious speeches inflaming the passions of the crowd. Some one at length indicated Hart's store, on Washington Street, between Dey and Cortlandt, as a vast hoard of provisions to relieve their distress, and the crowd surged toward it. The police were swept away and beaten, and although two of the three iron doors held, the center one was battered in, and the crowd began throwing flour barrels and sacks of grain into the street, staving in and tearing open such as did not burst by their own fall, and as one of the papers remarked, 'lowering prices by leaving less on the market.' A fresh onslaught by the police was repelled; and it was not till well into the evening that a body of militia dispersed the mob, which by this time had thrown into the street about 500 barrels of flour and 1,000 bushels of wheat, the most of it relieving no one. Herrick's stock was somewhat damaged also, and Meech's store attacked. The disturbance was attributed to the foreigners, but although the two ringleaders were foreign, four of the eight names signed to the call were American, and the natives certainly looked on at the mob without trying to assist the officers.

BREAD-ROOT (*Psoralea esculenta*): a leguminous

plant with edible, farinaceous tubers. It is the *Pomme blanche* or *Pomme de terre* of the French pioneers. It is common on the higher prairies from Texas through Iowa to Wisconsin.

BREADTH, n. *brĕdth* [Dan. *bred*, an edge or border; Sw. *bradd*, edge (see BROAD)]: a noun formed from the adj. *broad;* extent of surface in the shortest direction; width. BREADTH'LESS, a. having no breadth.

BREADTH, in Art: that peculiar disposal of the background of a picture which, without sacrificing or even concealing details, gives to the whole unity and harmony of effect. Often used indefinitely, it is yet not without definite meaning. With the older landscape-painters, it was a common fault to produce the effect of distance either by a certain trick of light and shadow, or by one uniform hazy color in which the individual objects were entirely lost to view, and *breadth became vacancy.* In this respect, their pictures contrast unfavorably with those of such modern painters as Turner, of whom Ruskin has truly said that 'the conception of every individual inch of distance is absolutely clear and complete in the master's mind—a separate picture fully worked out: but yet, clearly and fully as the idea is formed, just so much of it is given, and no more, as nature would have allowed us to feel or see; just so much as would enable a spectator of experience and knowledge to understand almost every minute fragment of separate detail, but appears to the unpracticed and careless eye just what a distance of nature's own would appear—an unintelligible mass. Not one line out of the millions there is without meaning, yet there is not one which is not affected and disguised by the dazzle and indecision of distance. No form is made out, and yet no form is unknown.' On the subject of breadth Ruskin has, moreover, the following judicious remarks: 'It were to be wished that our writers on art would not dwell so frequently on the necessity of breadth, without explaining what it means, and that we had more constant reference made to the principle, which I can only remember having seen once clearly explained and insisted on—that breadth is not vacancy. Generalization is unity, not destruction of parts; and composition is not annihilation, but arrangement of materials. The breadth which unites the truths of nature with her harmonies is meritorious and beautiful, but the breadth which annihilates those truths by the million is not painting nature, but painting over her; and so the masses which result from right concords and relations of details are sublime and impressive, but the masses which result from the eclipse of details are contemptible and painful.'

BREAD'-TREE: see CAFFER BREAD.

BREAK, n. *brāk* [AS. *brecan*, to break, to overcome; Goth. *brikan;* Ger. *brechen;* L. *frangĕrĕ*, to break: Icel. *braka*, to creak]: an opening or gap made by tearing; a

rent; a tear; a pause or interruption; a stop. V. to separate or divide by force; to rend; to crush; to weaken or impair; to crack or injure; to violate a contract or promise; to tame or train; to interrupt; to lessen the force of; to dissolve or abandon; to issue; to force a way; to explain or open a matter to any one; to decline in health; to fail in business; to dismiss, as to 'break' or cashier an officer. N. a high four-wheeled wagonette. BREAK'ING, imp.: N. shattering. BROKE, pt. *brōk*. BROKEN, pp. *brō'kn*. BREAKER, n. *brāk'ėr*, one who, or that which; a wave broken into foam by dashing on a rocky shore, or on invisible sunken rocks, showing danger of wreck to an approaching ship; something placed in a river for breaking the force of floating ice, or for breaking it up; a small cask for water—used in boats as ballast, and to meet emergencies. BREAK'AGE, n. *-āj*, a breaking; articles broken, and compensation for the same. BREAKING, or BREAKING-IN, taming or training horses. BREAKING, n. bankruptcy. BREAKING-DOWN ROLLERS, in *mech.;* rollers employed for the consolidation of metal by the process of rolling while hot. BREAKING-ENGINE, the first of a number of carding-machines, which receives and acts on the lap from the lapper. BREAKING-FRAME, a machine into which fragments of long-stapled wool are spliced together, and then drawn out to nearly eight times their original length. The fragments are produced by hand-combs, and taper toward the ends. BREAKING-MACHINE, an appliance for shortening flax-staple, to prepare it to be worked by the proper machinery. BREAK-NECK, a. *-nĕk*, steep; dangerous. BREAK-WATER, n. *-waw'tėr*, a mound or wall built in the sea, or at the mouth of a harbor, to break the force of the waves and protect the shipping. BREAK-BULK, to open a hole in a package or a load, etc., and take out some of it: see SALE OF GOODS. TO BREAK GROUND, in *mil.*, to commence a siege by opening trenches; to begin a new undertaking by an opening act. TO BREAK DOWN, to fail, or cause to fail. A BREAK-DOWN, a failure; a collapse; in U. S. a shuffling dance practiced by negroes. TO BREAK THE BACK, to dislocate the vertebræ or backbone, or to strain it severely; to ruin. TO BREAK A BANK, to exhaust or over-strain its resources by any means, as by a sudden run upon it. BREAK A LANCE, to have a contest with in argument, as formerly knights did with lances on entering the lists with a rival. TO BREAK THE HEART, to injure much, or to destroy with grief. TO BREAK UPON THE WHEEL, to punish a criminal capitally by stretching his body upon a wheel and breaking his bones. TO BREAK FORTH, to burst out; to exclaim. TO BREAK FROM, to go away with some vehemence. TO BREAK IN, to enter unexpectedly. TO BREAK INTO, to enter by force. TO BREAK LOOSE, to free from restraint; to escape into freedom. TO BREAK OFF, to desist suddenly; to abandon. TO BREAK OUT, to discover itself in sudden effects; to arise or spring

up. To BREAK THROUGH, to force a passage. To BREAK UP, to dissolve; to put a sudden end to. A BREAK-UP, a failure; a dissolution. To BREAK UPON, to discover itself suddenly. To BREAK WITH, to come to an explanation with; usually to end a friendship; to quarrel. BREAK OF DAY, dawn; the light preceding the appearance of the sun above the horizon. BREAKERS AHEAD, evidence announcing the hidden and fatal dangers to be encountered by proceeding further.—SYN. of 'break, v.': to rend; tear; burst; crack; split; crash; shatter; batter; violate; destroy; infringe; demolish; of 'breaker': wave; billow; surge.

BREAK-CIRCUIT CHRONOMETER: the name applied to a box-chronometer to which a device has been attached for breaking an electric circuit at stated intervals, usually once in two seconds.

BREAK'ER. See COAL MINING.

BREAKFAST, n. *brĕk'făst* [*break*, and *fast*]: first meal in the day, or the food so taken: V. to take the first meal. BREAK'FASTING, n. in the act of taking breakfast.

BREAKING BULK: the act of breaking open of a bundle, parcel, etc., and taking the contents, so as to constitute in law a conversion or the like.

BREAKING INCLOS'URES: in Scotch Law: see PLANTATION.

BREAK'WATER: barrier for protection of shipping in harbors or anchorages. It sometimes happens that, in front of a semicircular bay, a small island is so situated as to form a natural breakwater. This is to some extent the case with the Isle of Wight, which occupies such a position as to protect Portsmouth and Southampton from the south. A pier for a landing-place may be so placed and constructed as to serve also the purpose of a breakwater, but the term breakwater is generally confined to a structure solely for protection, and not for berthage or traffic, and breakwaters are frequently insulated from any communication with the shore unless by water.

Plymouth Breakwater, England, is a well-known engineering work. The sound or harbor, being open to the south, was so much exposed to storms that, early in the present c., it was determined to construct a breakwater across its mouth, with openings between it and the shore, on either side, for the ingress and egress of shipping, The works were commenced 1812. The operations consisted in transporting along a tram road large blocks of limestone from a neighboring quarry, shipping them in vessels fitted with trap doors, and by means of these depositing them in the shape of a huge mound in the required situation. As soon as the stones began to appear above water a perceptible benefit resulted in the relative calmness of the sound during storms; but the structure was frequently very roughly handled by the

waves, which altered and flattened its shape. A severe storm 1824, Nov., threw a great portion of the stones over into the sound. It was not until 1841 that the works were finally completed, by the deposition of more than 3,000,000 tons of stone, and the expenditure of nearly £1,500,000. The breakwater is nearly a mile long, the central portion is 1,000 yards; and two wings, of 350 yards each, extend from the ends of this at a slight angle. The open channels at each end, between the breakwater and the shore, are each about half a mile wide, and their depth is respectively 40 and 22 ft. at low water. The breakwater is 133 yards wide at the base, and 15 at the top—the two sides being made very sloping for the security of the stones. The slopes and top are faced with masonry. The water-space protected, comprises 1,120 acres.

Holyhead Breakwater, England, is formed of stone quarried in Holyhead Mountain, drawn along a tramway on a timber structure and cast into the sea. It more resembles a pier than the breakwater at Plymouth, for it is attached at one end to the shore, and is intended to convert Holyhead Bay or roadstead into a harbor of refuge. The works consist of a mound of loose stones up to low-water, and ashlar upright walls with a parapet above that line, with a railway on the top for trains.

Portland Breakwater, England, is of very great value, in converting into a harbor of refuge the expanse of water between the Dorsetshire coast and the isle, or rather peninsula, of Portland. An act of parliament, 1847, authorized the works. The breakwater, starting from the n.e. point of the isle, stretches nearly n. for more than two m. with one or two intervening openings for the ingress and egress of shipping. The works were conducted more easily than those of any other great breakwater; for the isle contains an abundance of stone easily quarried, and the steep shores afforded facility for transporting the stones by their own gravity to their destination. The work, finished 1872, is for the most part a rough rubble stone-bank, the part next the island having, however, an ashlar superstructure and parapet; the depth is about 50 ft. at low water.

Dover Breakwater, England, has involved an enormous outlay. There is no stone near to form a mound, as in the other breakwaters spoken of, and, in consequence, the work requires to be brought up in solid ashlar from the bottom by the diving bell, with the interior formed of blocks of concrete. It has never been clearly stated whether the British government regards this breakwater as a protection to a great naval station and fortified harbor, or as a chief feature as a harbor of refuge for commercial fleets. In 1844, a commission of inquiry recommended that £2,500,000 should be laid out in forming a harbor of refuge here. The works connected with it have not been finished, the great depth and frequent storms constituting terrible obstacles. The

water is very deep—viz., 42 feet at low water; the accumulations of shingle very troublesome; and many years must elapse before it can be made evident whether the Dover Breakwater is worth the national money expended upon it.

Alderney Breakwater, in the English Channel, is a great work, consisting of ashlar walls and parapet, built on a stone mound up to low water from a depth of 72 ft.

Cherbourg Breakwater, France, is the greatest and most costly ever constructed. Nearly 100 years ago, M. de Cessart proposed to the French government the formation of a breakwater at Cherbourg, to be commenced by the construction of a number of hollow cones formed of timber-framing, sunk in a line as close as they could be placed to each other, and then filled with stones. These cones, of which there were to be 64, each about 70 ft. high, 150 ft. in diameter at the base, and 60 ft. at the top, were intended to form a nucleus to the stone breakwater, to prevent the stones, during its formation, being knocked about and too much spread out by the action of the waves. In 1784–88, 16 cones were constructed, and 13 of them sunk; but so great was the destruction which they underwent during stormy weather, that the government at length abandoned the plan, and carried on the stone breakwater without the aid of the cones. It was completed under Napoleon III. at a cost exceeding £2,500,000. The breakwater itself was finished 1853, but since that year large fortifications have been built upon the upper works. The length is nearly 2½ m.; the breakwater is 300 ft. wide at the bottom, and 31 at the top. The chief mass consists of rubble or unshaped stones, thrown down from ships; but there is a larger ratio of wrought and finished masonry than in the Plymouth Breakwater, consisting of granite blocks embedded in cement. The depth of water is about 60 ft. at low-water spring-tides, and the breakwater rises to 12 ft. above high-water level. The water space included within and protected by the breakwater, is about 2,000 acres, but two-thirds of this has scarcely depth enough for the largest sized ships. For the relation of this breakwater to the vast military and naval arrangements of the place, see CHERBOURG.

In the United States the principal breakwater is at the entrance of Delaware Bay, Lewes, Del. The plan, devised 1829, was completed 1870; and in the first year thereafter, more than 20,000 vessels visited the harbor so provided.

Many substitutes have been proposed for solid breakwaters, such as floating breakwaters constructed of timber framework, open iron screens, etc., but none of them have been shown practically adequate. Close timberwork, filled in with stones, is found to be quite efficacious; but on many coasts the timber is liable to be eaten by the marine worm, which is an almost insuperable objection to its being used under water.

BREAKWATER.

The great breakwater at Buffalo, N. Y., was built to form a harbor for the immense lake traffic centering at that city. This structure forms the most important section of a long line of breakwaters that extend for 4½ m. along the water-front. At the time that the present work was undertaken there existed the north breakwater, which is built of concrete and extends for 2,200 ft., with a light at its southerly end. Opposite this light and to the westward of it is the northerly end of what is known as the old breakwater, a timber and concrete structure 7,608 ft. long. There is a light at the northerly end of the old breakwater, with a harbor entrance between it and the southerly light of the north breakwater. To the south of the old breakwater is the new structure now being considered. It consists of a stone breakwater 7,261 ft. in length, which connects with a timber and concrete structure extending south for another 2,739 ft., with a light at its southerly extremity. Parallel with the previous structure, and slightly to the westward of it, is a timber crib breakwater, 2,803 ft. long, which runs northerly from Stony Point. It has a light on its northern extremity, and the opening between this and the last named breakwater forms the south harbor entrance, the opening between the stone breakwater and the old breakwater being known as the middle harbor entrance. The 7,261-ft. stretch of the new breakwater is of the rubble mound type, stone-topped, while the southerly end of it, 2,739 ft., is of timber crib construction, to enable vessels to moor alongside of it inside of the harbor.

The new breakwater is built in the open waters of Lake Erie, parallel with the shore, 1,500 ft. out from the pierhead line of the harbor, and in 30 ft. of water. The first operation was to deposit two parallel ridges of small rubble on the lake bottom, one on the lake side and one on the shore side of the proposed breakwater, the intervening space being filled in with gravel. Another five ft. of rubble ridges were added and again filled in with gravel, the mound thus formed being raised to within 10 ft. of the surface of the water. The breakwater was then built up for the remaining 10 ft. to the surface of the lake by dumping upon it large rubble stones. The slopes of the structure were covered with a revetment of large stones, lowered into place in close touch with each other, so as to completely cover the rubble stone, the object of these heavy quarried stones being to prevent displacement of the rubble by the action of the water. Then came the important work of covering the mound with large capping stones, quarried to prescribed dimensions, many of the stones measuring as much as six feet in thickness. These stones were carried out by five large floating derricks, each with a lifting power of 20 tons. The capping stones were laid snugly together, the finished top and side of the breakwater presenting a fairly even and true appearance.

While the masonry breakwater was being constructed, the work of building the timber-crib structure was also going on apace. As compared with the rubble-mound type, the timber and concrete form has the advantage of being cheaper in construction. In building it the first step was to prepare a foundation and for this purpose a powerful clam-shell dredge built especially for the work was used to dredge a trench along the line of the breakwater in the bottom of the lake 95 ft. in width, and 50 ft. in depth through the clay. Then through the center of this trench another excavation was dredged out which was 50 ft. in width and extended everywhere to solid rock. The next task was to fill in the trench thus formed with gravel which was brought to the spot in scows and dumped in, a bed of gravel 30 to 40 ft. in depth being formed in this way. Upon this was placed an embankment of rubble stone eight ft. high, which formed a foundation for the timber cribs. These cribs were built of sawn timber and were 36 ft. wide, 22 ft. high, and from 60 to 180 ft. long. They were towed to position over the foundation and sunk by loading with stone. The superstructure was built in 3 benches, the first 6 ft., the second 10 ft., and the third 12 ft. above the mean water level of the lake. Each bench was 12 ft. wide. A certain portion of the crib breakwater, as finished, is of this construction; but the larger portion of it has been capped with concrete. This was done to strengthen the structure, the heavy gales of 1900, Sept. 12 and Nov. 21, in the latter of which the wind reached a velocity of 80 m. an hour, having loosened up and broken the above-water timber coping and finish. In repairing the ravages of the storm, the damaged superstructure was removed and the cribs cut down to an elevation of two ft. below the mean lake level. Upon this, concrete blocks, forming longitudinal and cross walls, were placed, and the pockets thus formed filled in with rubble stone, and roofed in with heavy concrete work, which was carried up to the level of the original breakwater. In place of the three benches of the crib superstructure, the reconstructed portion shows a parapet and a banquette. The parapet which is exposed to the lake side covers a width of 27 ft. and its crest is 12 ft. above mean lake level. The banquette is 8 ft. wide and is uniformly 4 ft. above the lake level. The new breakwaters have taken some six or seven years to construct, and the cost has been $2,200,000. Consult: *Reports of the Chief of Engineers U. S. A.;* Spon, *Dict. of Engineering;* Stevenson, *The Construction of Harbors;* De Cordemoy, *Les portes modernes.*

BRÉAL, *brā'al*, Michel Jules Alfred, French philologist: b. Landau, Rhenish Bavaria, 1832. He received his education at Weissenberg, Metz, the Lycée Louis-le-grand (Paris), and Berlin. He became professor of comparative grammar at the Collège de France in 1864;

and from 1879–88 was an inspector-general of higher education. He has written *L'étude des origines de la religion Zoroastrienne* (1862); *Le Mythe d'Œdipe* (1864); a translation of Bopp's *Vergleichende Grammatik*, with historical and critical introductions (5 vols., 1867–74); with A. Bailly, a *Dictionnaire etymologique latin* (1885); and numerous works on French educational questions.

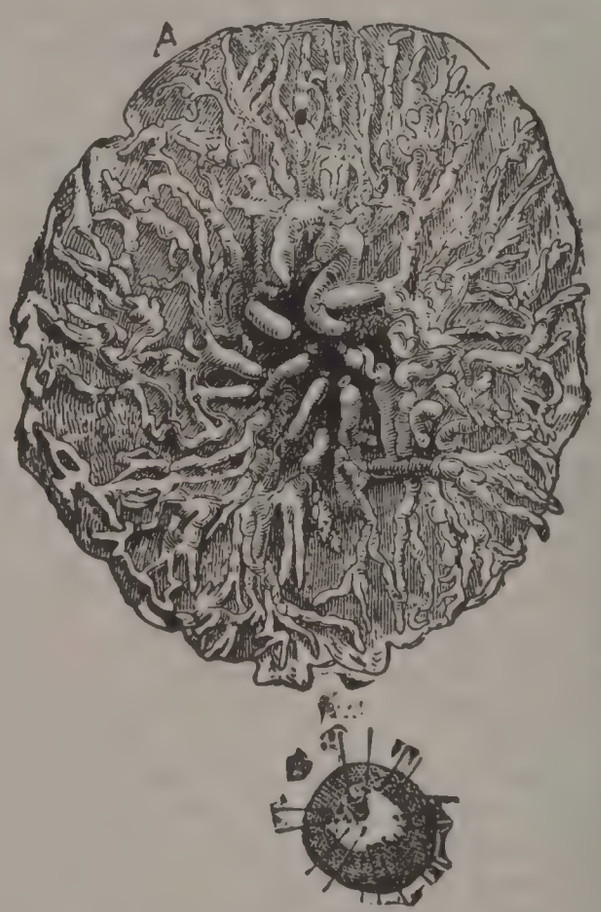
BREAM, n. *brēm:* a broad-shaped fish. The name occasions some confusion to beginners in ichthyology, being popularly applied equally to fresh-water fishes of the family *Cyprinidæ* (q.v.), and to sea-fishes of the families *Spardidæ* (q.v.), and *Chætodontidæ* (q.v.) or *Squamipennes*, among which the resemblance is a mere general one of outward form—the first of these families belonging to the order of *Malacopterous*, or soft-finned; the other two to that of *Acanthopterous*, or spiny-finned fishes.

The breams of the family *Cyprinidæ* were included in the genus *Cyprinus* (see CARP) by the older naturalists, but are readily distinguished from that genus as now defined, and from other allied genera, by their deep and compressed form, by the great convexity of both the dorsal and the abdominal outline, by the want of spiny rays in the dorsal and anal fins, by the great length of the base of the anal fin, and by the want of cirri or barbules at the mouth. They form the genus *Abramis* of Cuvier. The COMMON BREAM, or CARP BREAM (*A. Brama*), is an inhabitant of many rivers and lakes of Europe, even as far north as Norway and Sweden, and of some of those of Britain and Ireland. It thrives best in still waters, and in some lakes attains a large size; it has been known to reach 12 or even 14 pounds. The tail is very broad and much forked, the head small and acuminated, the eyes very large, the scales small, the general color yellowish-brown, the cheeks and gill-covers silvery white. The WHITE BREAM, or BREAMFLAT (A. *Blicca*) differs from the common Bream in its silvery color, the smaller number of rays in the pectoral and anal fins, and other particulars. It has never been taken of so large a size. It is found in many parts of the continent of Europe, and in some of the British lakes and rivers. The POMERANIAN BREAM (*A. Buggenhagii*) differs much more widely from the common Bream; the body is thicker in proportion to its depth, the scales larger, the base of the anal fin shorter, the tail less forked.

The acanthopterous BREAMS, or SEA BREAMS, are mostly of the family *Sparidæ*, and nearly allied to the Gilthead (q.v.), in connection with which they may most properly be noticed. The common Sea Bream, indeed, often receives the name of gilthead.

In the United States the term bream is given rather indefinitely to several minnows and sunfish; and to various marine fishes, better known as sea-breams.

BREAST, n. *brĕst* [AS. *breost;* Goth. *brusts;* Dut. *borst,* the breast: O.H.G. *prust,* a bursting, the breast]: the fore part of the human body, between the neck and the belly; in quadrupeds, the part between the fore feet; the heart; the conscience; the affections; in *mining,* the face of coal-working; the wooden partition that divides a shaft from bottom to top into two compartments: V. to meet in front. BREAST′ING, imp. BREAST′ED, pp. BREAST-DEEP, or BREAST-HIGH, up to the breast. BREAST-FAST, a large rope to affix a ship by her side to a quay or to another vessel. BREAST-HARNESS, a horse-gear arranged to pull by a band in front of the breast, instead of a collar. BREAST-



Breast:

A, lactiferous ducts dissected out and injected; B, nipple, with bristles inserted into the orifices of the lactiferous ducts.

HOOKS, or BREAST-KNEES, timbers placed in the forward part of a vessel across the stem to unite the bows on each side. BREASTPLATE, n. armor for the breast. BREAST-RAIL, the upper rail of the balcony on the quarter-deck. BREAST-STRAP, a strap passing from the hame-rings, or from the gullet of the collar, to support the tongue or pole of the vehicle. BREAST-WHEEL: see WATER-POWER. BREAST-WORK, in *fort.,* a mass of earth hastily thrown up for defense as high as the breast; in *nav.,* a set of framing terminating the quarter-deck and poop at the foremost and after end of the forecastle; a parapet not high enough to require a banquette (q. v.); a breast-work is, in size and im-

portance, between a parapet and a épaulement. BREAST-BONE, the bone at the breast; the sternum. BREAST-PIN, an ornamental pin used to fasten a necktie or any similar covering over the breast. TO MAKE A CLEAN BREAST, to make a full and free confession of particulars.

BREAST, THE FEMALE: the mammary gland; a series of tubes, radiating from a common centre, the nipple, around which is an areola or dark-colored patch. On the surface of the latter are several (4–10) sebaceous glands, which secrete an unctuous fluid to protect the skin of the nipple which is very thin, from the saliva of the sucking infant. The milk-*tubes* (15–18 in number) become widely dilated just beneath the nipple, enlarging into *sinuses*, and pass each to a separate lobe or subdivision of the breast, where they divide into twigs and branches (the *lactiferous ducts*), which end in minute vesicles. The lobes are held together by fibrous tissues, and are well packed in fat, which increases, sometimes to an enormous extent, the apparent size of the organ. The accompanying cut shows the structure of the gland.

Inflammation of the B. occurs most commonly when a woman is nursing her first child, but it may occur at any age. It begins with the usual signs of inflammation—redness and heat of the skin, pain and tenderness on pressure, and swelling. Unless the inflammation subsides early an abscess results. When an abscess forms it should be opened, the incision being in a line radiating from the nipple so as not to cut any of the milk tubes.

Tumors of the B. may be benign or malignant. The former are of several kinds, and of varying degrees of consistency; the latter are of two kinds, sarcoma and carcinoma. As it is difficult, if not impossible in many cases, to distinguish between a simple tumor and cancer of the B., the rule is to remove every tumor in this situation as soon as it is discovered. By early operation, even in the case of a cancer, life may be prolonged indefinitely; in many cases, indeed, there may be no recurrence of the growth.

BREAST'PLATE, in Ancient Armor: a plate of iron, steel, or other metal, so fastened as to protect the chest or front of the wearer. The back-plate, in like manner, was worn to protect from attack from behind. It being perceived that the free use of both hands in the employment of offensive weapons was important, the defensive armor was attached to the body, and received different names from its position, use, etc., as for instance, breastplate, cuisses, greaves. These different species of defensive armor are of little use against firearms, and have therefore, generally fallen into disuse in modern war. See CUIRASS. Breastplate, in Jewish antiquity, was a folded piece of rich, embroidered stuff worn by the high-priest. It was set with 12 precious stones bearing the names of the tribes. It was also called the breastplate of judgment, because it contained the Urim and Thummim.

BREAST-WHEEL: see WATER-POWER.

BREATH, n. *brĕth* [AS. *bræth*, an odor, scent: O.H.G. *prádam*, steam, vapor]: air drawn into the lungs of animals and driven out from the same—in man and the more highly organized animals, through the mouth and nostrils; respiration (see RESPIRATION); a single drawing in and driving out of air; a gentle breeze of air; life; pause; time to breathe; an instant. BREATHE, v. *brēth*, to draw in and give out air; to live; to rest; to speak softly to; to express, as words. BREATH'ING, imp.: N. respiration; utterance; an ardent desire or longing after; secret prayer; accent: ADJ. living; vital. BREATHED, pp. *.brēthd.* BREATH'ER, n. one who. BREATHFUL, a. *brĕth'fûl*, full of breath. BREATH'LESS, a. out of breath. BREATH'LESSLY, ad *-lĭ.* BREATH'LESSNESS, n. state of being out of breath. BREATHING PLACE, n. *brēth'ĭng-*, a pause. BREATHING-TIME, n. pause; relaxation. TO TAKE BREATH, to take rest after being somewhat breathless by exertion. OUT OF BREATH, exhausted and panting through exertion. TO BREATHE ONE'S LAST, to expire; to die. ROUGH BREATHING, in *Greek words*, the mark (‘), as a reversed comma, placed over a vowel to show that it is to be pronounced as if preceded by (*h*); the *spiritus asper.* SOFT BREATHING, the mark (’) indicating the absence of the (*h*); the *spiritus lenis.*

BREATH, OFFENSIVE: a disagreeable affection arising either from some cause limited to the mouth or nose, or from diseased conditions of the respiratory or digestive apparatus, the most frequent causes being decayed or dirty teeth and a disordered stomach. The treatment of foul breath consists in the removal of the cause, if this is possible. The teeth should be carefully examined, all cavities being plugged and tartar removed, and they should then be kept clean by brushing night and morning, or better, after every meal. Particles of food which have lodged between the teeth should be removed by a quill or toothpick, or, better, dental floss silk. A good dentifrice may be used at night, and if there is a tendency to looseness of the teeth a wash composed of a teaspoonful of tincture of myrrh in a pint of water is also very useful. Occasionally, the secretion from the tonsils (q.v.) is very offensive; and then a solution of nitrate of silver, 4 grains to 1 ounce of water, should be applied to them every morning, with a camel-hair brush, and small alterative doses of medicine administered. Should the fetid smell arise from a portion of dead bone in the jaw or nose, the dead part must be removed whenever it becomes loose. Inhalations of steam from hot water into which some creosote has been dropped, is often of service when the cause resides in a catarrhal condition of the nose and respiratory passages. When, however, the trouble is caused by digestive derangements, the treatment should consist in purging, to

empty the intestinal canal, followed by soda, to correct acidity, charcoal, and bitter tonics. In some cases no cause for the bad breath can be discovered, the condition seeming to be peculiar to the individual, in the same way that some persons have strong-smelling perspiration. In such cases the only remedy is to disguise the odor as far as possible by means of pastilles containing cardamom, cinnamon, coffee, and other aromatic substances. A mouth wash of borax, 30 grains, and strymol, 15 grains, in a quart of water may disguise the odor more or less in these cases.

BREATH-FIGURES: see COHESION FIGURES.

BREBEUF, *brā-bèf'*, JEAN DE: 1593–1649; b. Bayeux: French missionary. He entered the order of Jesuits, and was one of the first missionaries sent to Canada, whither he went with Champlain, 1626. He went among the Hurons, learned their language, and translated the catechism into that language. Champlain published this specimen of the language of the Indians of Canada, in his *Voyages of New France* (Paris, 1658). Some of Brebeuf's writings on the Huron language were translated by Albert Gallatin. In 1649 he and his companion, Lalemont, were captured by the Iroquois, and tortured to death by slow fire.

BRECCIA, n. *brĕch'ĭ-a* [It. a crumb or fragment]: in *geol.*, any rock composed of an agglutination of angular fragments, cemented together by an enveloping paste hardened, or by infiltrated iron or carbonate of lime—a *conglomerate* being composed of rounded water-worn pebbles. BRECCIATED, a. *brĕch'ĭ-ā-tĕd*, composed of angular fragments cemented together. OS'SEOUS-BRECCIA, n. a rock composed of fragments of bone cemented together.

BRECHE-DE-ROLAND, *brĕsh-dĕh-rō-lŏng':* defile of the Pyrenees, between France and Spain, about 11 m. s. of St. Jean de Luz, about 9,500 ft. above the sea. It is a difficult passage of from 200 to 300 ft. in width, between precipitous rocks rising 300–600 ft.

BRECHIN, *brĕK'n:* town of Forfarshire, on the left bank of the South Esk, 8 m. w. of its junction with the sea at Montrose. It unites with Montrose, Arbroath, Forfar, and Bervie in returning one member to parliament. Spinning, bleaching, distilling, and brewing are carried on, as also the manufacture of linens and sailcloth. B. was anciently a walled town, and contained an abbey of Culdees, instituted probably about the end of the 10th c. David I. founded a cathedral and bishopric here in the 12th c. Part of the cathedral, built chiefly in the 13th, 14th, and 15th c., is now the parish church. Close to the church is a round tower, similar to the Irish ones, and to the one at Abernethy, the only other example in Scotland. The tower is 85 ft. high, 25 ft. in diameter at the base, and 12⅓ ft. at

the top, and it is surmounted by a 15th c. spire of 25 ft. B. Castle, the ancient seat of the Maules (now of their representative, the Earl of Dalhousie), was taken by Edward I., 1303, after a siege of 20 days. Brechin was burned by Montrose, 1645; and near it, Huntly, on the part of James II., defeated the Crawfords in 1452. Gillies, the historian of Greece; Maitland, the topographer; and Dr. Guthrie, the famous Scotch preacher, were natives of Brechin. Pop. 8,941.

BRECK, *brĕk*, James Lloyd: American clergyman: b. Philadelphia, 1818, June 27; d. Benicia, Cal., 1876, March 30. He graduated at the University of Pennsylvania in 1838, and at the General Theological Seminary, New York, in 1841. The same year he went to Wisconsin, and aided in the formation of the diocese there in 1847. He was one of the founders of the Nashotah Theological Seminary, remaining as instructor there until 1850, when he went to St. Paul, Minn., as a missionary. There he established an associate mission, and assisted in supplying mission stations for 80 miles around. From 1852 to 1857 he was engaged in missionary work among the Chippewa Indians. In 1858 he established church services at Faribault, Minn., and founded the Seabury Divinity School. He prepared the way for building church institutions there, and was the forerunner of Bishop Whipple. In 1867 Dr. Breck went to Benicia, Cal., where he established church enterprises similar to those at Nashotah and Faribault.

BRECK, Samuel: American soldier: b. Middleborough, Mass, 1834, Feb. 25. He is descended from Edward Breck, who came to Dorchester, Mass., from Ashton, England, about 1630. He graduated at West Point 1855, and took part in the Seminole war of 1855–6. During the Civil War he was assistant adjutant-general of McDowell's division, and afterward of the 1st Army Corps, being engaged in the occupation of Fredericksburg and in the Shenandoah Valley expedition, to intercept the retreat of the Confederate forces under Gen. Jackson in 1862. From July, 1862, to 1870 he was assistant in the adjutant-general's office at Washington, in charge of rolls, returns, books, blanks and business pertaining to the enlisted men of the regular and volunteer forces, and engaged in the preparation and publication of the *Volunteer Army Register*. He became brigadier-general and adjutant-general in 1897, and was retired by operation of law, 1898, Feb. 25. He wrote *Genealogy of the Breck Family* (1889); *Magoun Memorial* (1891).

BRECKENRIDGE, Minn.: a village and county-seat of Wilkin County, on the Red River of the North, about 50 m. south of Fargo, North Dakota. It is reached by the Northern Pacific and Great Northern railroads and is the centre of a very fertile region. It contains

flour mills, grain elevators, etc., and steamboats ply between it and the Red river towns in Manitoba. Pop. (1910 est.) 1,500.

BRECK'ENRIDGE, *brĕk'n-rĭ̆*, Hugh Henry: American artist: b. Leesbury, Pa., 1870. In 1892 he was awarded the European scholarship of the Pennsylvania Academy of the Fine Arts, and studied in Paris under Bourguereau, Ferrier, and Dorcet. Since 1894 he has been an instructor, and secretary of the faculty in the Pennsylvania Academy of the Fine Arts, and in 1898 organized the Darby School of Painting. His work was awarded a medal at Atlanta in 1895, received honorable mention at the Paris Exposition of 1900, a medal at the Pan-American Exposition at Buffalo 1901, and the Corcoran prize, Washington, 1903. He was a member of the jury of awards at the St. Louis Exposition, 1904.

BRECKENRIDGE, Robert Jefferson, D.D.: 1800, Mar. 8—1871, Dec. 27; b. Cabell's Dale, Ky.: Presb. clergyman, teacher, and author. He studied at Princeton, Yale, and Union colleges, graduating at Union in 1819. He practiced law eight years, and was four years a member of the legislature. He then studied theology, and became pastor of the Second Presb. ch. in Baltimore, 1832; pres. of Jefferson College, Penn., 1845; supt. of public instruction in Ky., 1847, and prof. of theol. in the theol. seminary at Danville, Ky., 1853. Among his works are *The Knowledge of God Objectively Considered* (1857), and *The Knowledge of God Subjectively Considered* (1859). In the civil war he supported the Union.

BRECKENRIDGE, William Campbell Preston: 1837, Aug. 28; d. 1904, b. Baltimore, Md.: politician. He graduated from Center College, Danville, Ky., 1855, in law at the univ. of Louisville, Ky., 1857. He was prof. of equity jurisprudence in Cumberland Univ., Lebanon, Tenn. He served as colonel in the Confederate army. He was elected to Congress 1884, and served till 1894, when he failed of re-election in consequence of a breach-of-promise suit instituted against him.

BRECK'INRIDGE, Clifton Rhodes: American legislator and diplomatist: b. Lexington, Ky., 1846, Nov. 22. He is a son of John Cabell Breckinridge (q.v.), and received a public school education and served in the Confederate army and navy. After the war he attended Washington College (now Washington and Lee University) for three years, and engaged in mercantile business in Pine Bluff, Ark. He was elected to congress in 1882 as representative-at-large, as a Democrat; was re-elected in 1884, 1886, 1889, 1890, 1892 and 1894, and served on the Committee on Ways and Means during the greater part of his congressional life. He was United States Minister to Russia, 1894–7.

BRECKINRIDGE, or BRECKENRIDGE, JOHN: American statesman: b. Augusta County, Va., 1760, Dec. 2; d. Lexington, Ky., 1806, Dec. 14. In 1795 he was made attorney-general of the new state of Kenttucky, and he served in its legislature from 1797 to 1800. He entered the United States Senate in 1801, becoming four years later attorney-general in Jefferson's cabinet, in which office he died.

BRECKINRIDGE, JOHN: American clergyman: b. Cabell's Dale, Ky., 1797; d. 1841. He entered the Presbyterian ministry, and was chaplain of the National House of Representatives, 1819–21. He was pastor at Lexington, Ky., 1823–6, and in Baltimore 1826–31. He was subsequently professor of theology at Princeton Theological Seminary, and was chosen president of Oglethorpe University, Georgia, just prior to his death. He is remembered for a famous theological debate held with Rev. John Hughes, subsequently archbishop of New York, published under the title *Roman Catholic Controversy* (1836).

BRECKINRIDGE (or BRECKENRIDGE), JOHN CABELL: 1821, Jan. 21—1875, May. 17; b. and died near Lexington, Ky.: statesman and general. He studied law and practiced in Lexington; served in the Mexican war; was elected to congress in 1851, and re-elected in 1853. In 1856 was elected vice-president of the United States, and in 1860 nominated for president by the extreme Southern Democrats, but was defeated by Abraham Lincoln. A United States senator from March to December 1861, he then entered the Confederate army, was appointed a major-general in 1862, and held some important commands during the Civil War. He was secretary of war in Jefferson Davis' cabinet, at the close of the struggle, and escaped to Europe, whence he returned in 1868, and resumed his law practice.

BRECKINRIDGE, JOSEPH CABELL: American military officer, nephew of John Cabell Breckinridge (q.v.): b. Baltimore, Md., 1842, Jan. 14. He practiced law in Danville, Ky., till the beginning of the Civil War, when he joined the Union army. He was made a first lieutenant in the regular army 1863, captain in 1874, brigadier and inspector-general in 1889, and major-general of volunteers 1898, May 14. He served in the Santiago campaign and had a horse shot from under him. On 1903, Feb. 18, he was appointed major-general in the regular army.

BRECKNOCKSHIRE, *brĕk'nŏk-sher:* or BRECON, *brĕk'un:* inland county of s. Wales, s. of Radnor, from which it is separated by the Wye. Its length is about 35 m.; average breadth, 20; 719 sq. m., of which two-thirds are cultivated. Brecknockshire is one of the most mountainous countries in s. Wales, and has deep, beautiful, and fertile valleys. Two principal mountain-

chains, the highest in s. Wales, rising with Brecknock Peaks, 2,862 ft., intersect the county in the n. and s., and occupy, with their off-shoots, a great part of the surface. Old red standstone occupies the south and middle of the county, and Silurian rocks the north. The chief rivers are the Wye, Usk, Yrfon, Elan, Claerwen, and Tawe. The climate is severe and rainy but healthful among the mountains, and in the valleys comparatively mild. The agriculture, though still defective, especially in the higher districts, was greatly improved by the Brecknockshire Agricultural Soc., instituted 1755. The chief crops are oats and barley, but much wheat also is grown in Talgarth and Crickhowell, the most fertile districts of the county. In the valleys in the e. some hops are raised, and there are some orchards. The native small black-cattle are reared in the hills, while in the lowlands the Hereford breed predominates. The mineral product is small, consisting of iron, especially along the s. border; coal and limestone also are found in the s. and w. The Brecon canal connects the county with the Bristol Channel, and many railways have been constructed. There are several small factories of woolens and worsted hosiery; also several important iron-works, but the ore is obtained chiefly from adjoining counties. The chief towns are Brecon (the county town), Builth, Crickhowell Hay, and Llanelly. There are many remains of British and Roman camps, Roman roads, cairns, cromlechs mounds, and castles throughout the county. Brecknockshire formed part of the territory of the Silures, who bravely withstood the Romans. The Normans, under Barnard Newmarch, wrested the county from the Welsh princes 1092. Llewelyn, the last British prince of Wales, was killed in this county, 1282, and by his fall the native mountain-chiefs were entirely subdued. Half the people still speak Welsh. Brecknockshire returns one member to parliament. Pop. 59,906.

BRECON, *brĕk'un*, or BRECKNOCK, or AB'ERHOND'DU: cap. of Brecknockshire, s. Wales; in an open valley in the middle of the county, at the confluence of the Usk, Honddu, and Tarell, 171 m. w.n.w. of London. It is in the midst of fine mountain scenery, and has beautiful public walks. South of Brecon lie the three mountain-peaks, the Brecon Beacons. Flannels, coarse woolens, and hats are manufactured. Barnard Newmarch, a relative of William the Conqueror, founded the town, and built a castle here, 1094. He also founded two priories here in the reign of Henry I. Henry VIII. turned one of the priories into a college, still existing; the other is now the parish church. Brecon was formerly surrounded by a wall having ten towers and five gates. Hugh Price, founder of Jesus College, Oxford, and Mrs. Siddons, the celebrated actress, were natives of Brecon. Pop. 5,875.

BRED; pp. of Breed, which see.

BREDA, *brā-dâ':* town of N. Brahant, Holland, at the confluence of the navigable rivers Merk and Aa. It formerly possessed the means of laying the surrounding country under water in the event of an attack, but the importance of the town, as a military position, has passed away, and in 1876 the fortifications were removed. It has a Gothic cathedral, with a lofty tower and several interesting mounuments; also an old castle built 1350, which was for some time the residence of Charles II. of England, and is now a military acad. There are manufactures of carpets, linen, hats, soap, leather, etc.; and dye-works, breweries, and rope-walks. It is celebrated as the place where, 1566, the protest of the Dutch nobles, known as the 'Compromise of Breda,' against the measures of Philip II. of Spain in the Netherlands, was presented and rejected. During the subsequent centuries, it was the scene of much conflict and diplomatizing until 1813, when the French were finally driven out. Brecon is a very important railway centre. Pop. (1901) 26,296.

BREDA, *brėh-dâ*, Jan van: 1683–1750: Flemish painter of landscapes, battles, etc. He copied the works of Breughel and Wouverman so cleverly that it was difficult to distinguish the copy from the original. Descamps specially praised his touch and distances and skies.

BREDE, n. *brēd:* a twist, braid, a piece of braiding.

BREDERODE, *brā-dėh-ro'dēh*, Hendrik van, Count: 1531–68; b. Brussels: a sovereign count of Holland, who was an aggressive, active leader against the ascendency of the Spaniards in his native land. He was a follower of Egmont and Horn, but his impulsiveness caused as much dissatisfaction to his own party as to that of his opponents. His cause was unsuccessful, the complete victory of the Spaniards making it necessary for him to flee the country. He took refuge in Germany, but survived but a short time, dying from disappointment and intemperance.

BREDOW, Gabriel Gottfried, *gâ'brĭ-ĕl gŏt'frēd brā'dō*, German historian: b. Berlin, 1773, Dec. 14; d. Breslau, 1814, Sept. 5. He was for a time professor at Eutin, and a colleague of the celebrated Voss; afterward professor at Helmstädt, and still later at Frankfort-on-the-Oder, whence he went to Breslau on the removal of the university to that place. He was distinguished for his patriotism and his literary works. His *Handbuch der alten Geschichte* (Manual of Ancient History) passed through five editions, the fifth of which appeared in 1825. He was the author of *Chronik des Neunzehnten Jahrunderts* (Chronicle of the 19th Century); *Epistolæ Parisienses; Untersuchungen über Geschichte, Geographie, und Chro-*

nologie (Researches in History, Geography, and Chronology); and the very useful *Historische Tabellen* (Historical Tables), which were translated into English.

BREE, or BRIE, n. *brē* [AS *brùwan*, to brew: Icel. *brugg*, a decoction: *Ger. brühe*, broth, sauce]: in *Scot.*, the liquid that has been brewed; any liquid; broth; soup; the brine of a herring-barrel. BARLEY-BREE, malt liquor, whisky.

BRÉE, *brā*, MATTHÆUS IGNAZIUS VAN: 1773, Feb. 22—1839, Dec. 15; b. Antwerp: excellent Flemish painter. He was educated partly at Antwerp, and partly under Vincent in Paris. As early as 1798, he attracted attention by his *Death of Cato*, and several other excellent pictures soon followed. A peculiar talent for rapid and vivid sketching enabled him to execute for Napoleon, in a few hours, *The Maneuvering of the Fleet before Antwerp on the Scheldt;* and, with equal celerity, Napoleon's *Entrance into Amsterdam, at the moment when the Magistrate presents him with the Keys of the City.* In 1816, he painted the famous Leyden burgomaster, Van der Werff, in the act of addressing the famished and murmuring populace during the siege of 1576. 'Take my body, and share it among you.' This great work—now in the townhouse of Leyden—is marked by a felicitous arrangement of the figures, and by a bold and lively coloring, after the style of Rubens. Other celebrated pictures of his are *Count Egmont receiving Scriptural Consolation before his Execution; Rubens dictating his Dying Testament; The Tomb of Nero at Rome, with a Group of Lazzaroni and Musicians.* Van Brée had the title of painter to the Empress Josephine and represented many scenes connected with the French occupation of Belgium. He replaced Herreyns as director of the Academy of Fine Arts at Antwerp, and gained a high reputation by his teaching. He also evinced a capacity to excel in sculpture and lithography.

BREECH, n. *brĭch* [AS. *bræc;* L. *braccæ;* Icel. *brok* plu. *brækr;* It. *brache;* OF. *bragues*, trousers: Scot. *breeks*, trowsers—from Gael. *briogais*, breeches]: the part where the body separates into two legs: V. to put into breeches; to whip on the breech. BREECH'ING, imp.: N. the part of a harness which passes round the hinder part of a horse; the parts forming the breech of a gun; a flogging. PLU. the strong ropes with which cannon are lashed or fastened to the ship's side, checking the recoil at such a point that the muzzle is brought wholly within the port-hole, where it can be sponged and re-loaded. BREECHED, pp. *brĭcht.* BREECHES, n. *brĭch'ĕz*, a close-fitting garment worn by men, lads, and boys, covering the lower part of the body; trousers, originally terminating immediately beneath the knees. TO WEAR THE BREECHES, a familiar term to a wife who usurps the husband's place and power in a household.

BREECHES-BUOY, *brĭch'ez bwôi:* a life-saving device consisting of canvas breeches attachable at the waist to a ring life-buoy which is slung on a rope stretched from the shore to a wrecked vessel. BREECHES BIBLE: Designation of a Bible printed in 1579, in which Genesis iii, 7 reads: 'They sowed figge tree leaves together and made themselves breeches.' See BIBLE.

BREECH, n. *brēch* [from preceding entry]: the hinder part of anything, especially of a gun. BREECH-LOADER, n. a firearm that receives its charge at the breech, or thick end. The chief advantages of this method, over muzzle-loading, are that it greatly increases the quick-firing capacity of the weapon, and adds to the length of range and accuracy of aim, while affording much facility for cleaning. Though it has only been successfully adopted in modern times, the breech-loading principle is nothing new, as some of the earliest cannon were so constructed. The first weapon of this description utilized as a regular military arm was the needle-gun adopted by the Prussian government in 1841. Other nations also speedily armed their troops with breech-loading rifles, the French having adopted the Chassepôt breech-loader in 1866, and in Britain the old Enfield rifle having been converted into a breech-loading weapon and supplied to the troops the same year. In 1871 the Snider or converted Enfield began to be superseded by the Martini-Henry rifle, and this again has been superseded in the British army by the Lee-Metford magazine rifle. Other European nations have also adopted different forms of breech-loading rifles. The principle of breech-loading has also been applied to artillery.

BREECHES, a garment for the legs, especially, as distinguished from trousers, for covering the upper portions of the legs. In England they were formerly called hose. Breeches or hose were in use even among the ancient Babylonians, and with them were made so as to cover the foot and supply the place of stockings. In Europe we find hose first used among the Gauls, hence the Romans called a part of Gaul breeched Gaul (*Gallia braccata*). In the 5th century they had become fashionable in Rome. In the time of Queen Elizabeth and James I. the breeches had assumed enormous dimensions, being stuffed out with various materials, as wool, hair, etc. King James' partiality for such breeches is well known, and we find him represented in an old engraving with wide stuffed breeches tapering to the knee, slashed and adorned with lace. In the reign of Charles I. they took the form of short trousers, loose at the knee, and ornamented with ribbons, lace, etc. In the time of William III. the tight knee-breeches came in, and have been supplanted by trousers only in the 19th century.

BREECH-LOADING GUNS. See GUNS; ORDNANCE.

BREED, v. *brēd* [AS. *bredan*, to nourish, to cherish: Dut. *broeden*, to hatch as eggs: Ger. *brüten*, to bring eggs or spawn into active life: W. *brwd*, hot, warm]: to bring animals into active life, as from seed, spawn, or eggs; to generate; to hatch; to produce young; to occasion; to educate; to train; to instruct; to raise from the best kinds: N. a race of men or other animals from one stock; a kind; a caste; offspring; a variety; a hatch, a brood. BREED'ING, imp.: N. education; manners. BRED, pp. *brĕd*. BREED'ER, n. one who raises a breed or kind; a prolific female. TO BREED IN AND IN, to raise animals of the same stock from those that have already been raised or crossed. GOOD BREEDING, genteel deportment; the politeness resulting from culture and birth.—SYN. of 'breed, v.': to engender; procreate; propagate;—of 'breeding'; nurture; training; manners; instruction; education.

BREED, in Domestic Animals: a variety or often merely a race distinguished by the possession of particular qualities, but not differing from the ordinary type of the species so as to constitute what naturalists usually designate a variety. The peculiarities of breeds in animals have an exact counterpart in cultivated plants, the value of particular kinds often depending, in a great measure, upon characters scarcely capable of being defined in the language of scientific description, but to the production and perpetuation of which the attention of the cultivator cannot be too earnestly directed. These, also, in plants, as in animals, have of themselves little permanence, and the preservation or perpetuation of them depends upon the same assiduous attention and high cultivation from which, more frequently than from any mere accidental circumstances, they have originated. Thus it happens that the most improved varieties of garden-plants usually degenerate even under ordinary horticultural treatment, and the choice pansies of the florist lose their characteristic excellences if a place is simply assigned to them in a common flower-border. To the breeding of the most valuable domestic animals, great attention has of late been paid—probably more since the beginning of the 19th c. than in all the previous history of the world—and with results the magnitude of which may in some measure be estimated from the statement on competent authority, that in the second 30 years of this century the weight of mutton produced was about doubled in proportion to the number of sheep kept. To the improvement of the breed of horses, attention has been paid for a much longer time than to that of oxen and sheep; and to this must, in a great measure, be ascribed the different excellences of some of the well-known breeds employed for very different purposes. The use of the horse in war, and for purposes of pomp and luxury, appears to have been the

reason of the higher degree of attention thus given it, even from ancient times. The Arabs have long been particularly careful of the breed of their horses, and diligently preserve a record of their pedigree. What is called *blood* in horses, however, only fits them in a higher degree for certain purposes; and with regard to this as to other animals, the judgment of the breeder must be exercised as the perpetuation, increase, or combination of particular qualities may be the object which he has in view. Fleetness and strength are important qualities in horses, the extremes of which never coexist in the same animal, but of which a certain combination is for some purposes very desirable; and either of these may be displayed in a great degree without much *bottom*, or power of enduring continued severe exertion—a quality of very high value. The properties most desired in sheep and oxen are very different from those most highly esteemed in the horse—the fleece and the flesh being chiefly regarded in sheep, the flesh and the milk in oxen. Sometimes a perpetuation of good qualities is the great object of the breeder, and a combination of them in the highest possible degree is aimed at; sometimes, the production of the largest possible quantity of beef or mutton in the shortest time being almost exclusively designed, the breeder neglects considerations which would be of importance if his stock could not be improved by animals obtained from other quarters. Extraordinary differences are certainly found among animals of the same species in the readiness with which they convert food into flesh and fat, and in the age at which they are fit for the hands of the butcher. One effect of the attention bestowed of late upon the breeding of stock, has been to supply the market, to a great extent, with the flesh of younger animals than could previously be sent to it—a change evidently tending not only to the benefit of the farmer but the the increase of the national wealth; because the land, even without increased produce of grass, sends a greater amount of beef and mutton to market within the same term of years. Those sheep and oxen which exhibit in the highest degree the qualities just referred to, are characterized by shortness of legs, smallness of bones, smallness of head, and fineness of skin; qualities the opposite of those which would fit the animal for a wild state and an independent existence. For the most important breeds of domestic animals, see their titles.

As to the rules and physiological principles of breeding, it may be said that the principles, so far as application of them has yet been found practicable, are only the best known principles of physiology (q.v.), while the rules which guide the breeding of stock have mostly been learned by experience, and are to be regarded rather as contributions to science than as deductions from it. The probable relative influence of the male

and female parent upon their progeny, is a point unquestionably of the greatest importance, but concerning which widely different opinions have been maintained; and another much controverted and important point is, the propriety of *breeding in and in.* Practically, the rule is always observed by those who seek the improvement of a *breed,* of selecting the very finest animals possible, both male and female; although a great improvement of the existing stock on a farm is often effected in the most advantageous manner by the mere introduction of males of better quality. The dangers of breeding *in and in* are very generally acknowledged, even while it is contended that they may very much be obviated by careful rejection of every faulty animal, and that in this way the utmost advantage may be taken of the very highest improvements; but it is likewise generally admitted that, if equally improved individuals can be obtained not so nearly related, it is better to seek the perpetuation of the breed by their means. It is a rule also of much practical importance, that an improvement of breed is to be attained not by a *cross* between animals of very different breeds, as between a dray-horse and a race-horse, but only between those which are comparatively similar. The result of the intermixture of very dissimilar breeds is never in any respect satisfactory.

BREEDÉ, *brā'dėh* or *brēd:* river in Cape Colony, flowing chiefly through the dist. of Zwellendam, which contains Cape Agulhas, the most southerly point of Africa. It rises in the Warm-Bokkeveld, a mountain-basin about lat. 33° 10′ s., long, 19° 30′ e., running first w., and afterward s.e.; and it enters St. Sebastian's Bay or Port Beaufort, from which, upward, it is navigable 40 m. Its exports are wool, aloes, skins, feathers, grain, butter, cattle, mules, etc.

BREEKS, n. plu. *brēks* [Icel. *brók*]: in *Scot.,* breeches; trousers: see BREECH 1.

BREESE, n. *brēz:* see BREEZE 2.

BREESE, *brēz,* SIDNEY: 1800–1878; b. Whitesboor, N. Y.: jurist. Having graduated at Union College, 1818, he removed to Illinois, where he was state attorney 1822–27, and then U. S. attorney for Illinois. In 1841 he was elected judge of the supreme court. He was U. S. senator 1843–49. As chairman of the senate committee on public lands he reported in favor of a transcontinental railroad. During the last five years of his life he was chief justice of the supreme court of Ill. He published *Origin and History of the Pacific Railroad.*

BREEZE, n. *brēz* [F. *brise,* a cool wind: It. *breeza,* chillness or shivering, a cold wind: imitative of a rustling noise]: a soft blowing wind; a gentle gale (see WIND): V. to blow gently. BREEZY, a. *brē'zi,*

subject to frequent breezes. BREEZE'LESS, a. SEA'-BREEZE, the wind or breeze blowing from the sea. LAND'-BREEZE, the wind or breeze blowing from the land toward the sea.—SYN. of 'breeze, n.': wind; blast; gale; gust; storm; tempest; hurricane.

BREEZE, n. *brēz* [AS. *briosa,* and *brimsa;* Ger. *bremse,* a gad-fly: Ger. *brummen;* Fris. *brimme,* to hum]: a gad-fly; a stinging fly; also spelled BRIZE, BREESE.

BREEZE, n. *brēz* [F. *bris* or *débris,* rubbish: Ger. *brosame,* a crumb: Gael. *bris,* to break]: dust; rubbish; ashes and cinders used in brick-making; refuse coal; also spelled BRISS, BRIST.

BREGENZ, *brā'ghĕnts:* frontier town of Austria, cap. of the dist. of Vorarlberg; at the mouth of the small river B. which here flows into the Lake of Constance, between the Swiss and Bavarian territories, about 80 m. w.n.w. of Innsprück. From the ruins of the castle of Hohenbregenz, on a hill near the town, a very beautiful prospect is obtained of the lake and its surrounding vineyards, etc. Bregenz is one of the oldest towns, and was formerly one of the chief fortified places in the s. part of Germany. The inhabitants are engaged in agriculture, horticulture, and cattle-keeping. Cotton-spinning and weaving also are carried on; and articles of wood, gold, and iron are manufactured. Its position secures Bregenz a large transit-trade in the produce of the district. In the neighborhood lies the mountain-pass, the *Bregenzer-Klause,* formerly a strong military position between Swabia and the Tyrol. During the Thirty Years' War, the Swedes, 1646, stormed and captured the fortress of Bregenz, and destroyed the works in the pass. Pop. 6,739.

BREGMA, n. *brĕg'mă* [Gr. *bregma,* the fore-upper-part of the head—from *brecho,* I moisten or wet]: the top of the head; the two spaces in the infant's head where the part of the bone is the longest in hardening.

BREHON, n. *brē'ŏn* [Ir. *breathamh;* Gael, *breith,* judgment]: a judge: ADJ. a term used in ancient times to designate the common (and probably at first unwritten) laws of Ireland. BREHON LAWS, the system of jurisprudence which prevailed among the native Irish from an early period till toward the middle of the 17th c. The *breitheamhuin* (pronounced *brei-hoo-in,* or *brehon*), from whom the laws had their name, were hereditary judges, who administered justice among the members of their tribe, seated in the open air, upon a few sods, on a hill or rising ground. The poet Spencer, in his *Views of the State of Ireland,* 1596, describes the Brehon laws as 'a rule of right unwritten, but delivered by tradition from one to another, in which oftentimes there appeareth great share of equity, in

determining the right between party and party, but in many things repugning quite both to God's law and man's: as, for example, in the case of murder, the brehon—that is, their judge—will compound between the murderer and the friends of the party murdered, which prosecute the action, that the malefactor shall give unto them, or to the child or wife of him that is slain, a recompense, which they call an *eric:* by which vile law of theirs many murders amongst them are made up and smothered: and this judge being, as he is called the lord's brehon, adjudgeth for the most part a better share unto his lord, that is, the lord of the soil, or head of the sept, and also unto himself for his judgment, a greater portion than unto the plaintiffs or parties grieved.' Spencer seems not to have known that pecuniary compensation for manslaughter had obtained in the ancient laws as well of England as of most European nations. He was incorrect, too, in believing that the Brehon laws was an unwritten code. Many manuscript collections of the Brehon laws still exist in public and private libraries in Ireland, England and Belgium. These manuscripts are regarded as varying in date from the early part of the 14th to the close of the 16th c. For the laws themselves a much higher antiquity is claimed. 'So far as we have external evidence to guide us,' says Dr. J. H. Todd and Dr. C. Graves, two eminent Irish antiquaries, 'there is no reason to suspect that the Brehon laws have undergone any material change since the time of Cormac Mac Cuilleanain, king and bishop of Cashel, who died A.D. 908. He was a man of great learning and energy, who certainly promoted the execution of considerable literary works, and under whose influence it is not improbable that a systematic compilation of the laws may have been affected. Of this, however, we have no distinct record. On the other hand, we find scattered through all parts of the laws allusions to a general revision of them made in the 5th c., at the instance of St. Patrick, who, in conjunction with certain kings and learned men, is said to have expunged from them all those institutions which savored of paganism, and to have framed the code called the Seanchus Mor. These same documents assert the existence of still more ancient written laws, the greater part of which are ascribed to Cormac Mac Art, monarch of Ireland, in the middle of the 3d c. However slow we may be to acquiesce in statements of this kind, which contradict what we have learned concerning the progress of legislation in the remaining parts of western Europe, we may readily admit that the subject-matter of many of the laws demonstrates their great antiquity, as it indicates the primitive nature of the society in which they prevailed. In spite of the attempts to efface it, traces of heathenism are still discernible in many parts of them. They enumerate various ordeals of a pagan char-

acter, which are expressly termed *magical*, and specify the occasions on which a resort to them was prescribed. There are also provisions in the laws of marriage which prove that Christianity could have exercised but a feeble influence at the time when they were enacted. The language in which the Brehon laws are written is a convincing proof of their antiquity. They are not composed of a peculiar dialect, as many writers have maintained; but if their style differs from that of the vernacular Irish of the present day, as Anglo-Saxon does from modern English, this dissimilarity is to be ascribed mainly to the effects of time, by which the orthography and grammatical forms of the language have been modified, and legal terms and phrases of constant recurrence have become obsolete.' The world of letters will be able in no long time, to judge for itself on the opinions thus expressed. It is now upward of 30 years since the publication of the Brehon laws, at the charge of the Irish government, was strongly urged by such men as Guizot, Grimm, and Ranke abroad, and Hallam, Macaulay, and Earl Stanhop in England. A commission was accordingly appointed by the Earl of Eglinton, 1852, 'to direct, superintend, and carry into effect the transcription and translation of the ancient laws of Ireland, and the preparation of the same for publication.' The commissioners entrusted the transcription and translation of the Brehon laws to the two most eminent of Irish scholars—the late Dr. John O'Donovan, prof. of Celtic in the Queen's College at Belfast; and the late Eugene O'Curry, prof. of Irish archeology in the Rom. Cath. Univ. of Ireland. These gentlement having finished their task, the editorship of the work was entrusted to Mr. W. J. Hancock, late prof. of political economy in Trinity College, Dublin, and the Rev. Thaddeus O'Mahony, prof. of Irish in the Univ. of Dublin. The publication, it is reckoned, will extend to eight vols. of about 550 pages each. Three of these have already appeared—the last in 1873—under the title of *Ancient Laws and Institutes of Ireland.* With the Irish text an English translation is given, accompanied with preliminary dissertations, glossaries, and indexes, and they give a vivid and characteristic picture of the polity and social life of a Celtic people. A fac-simile reprint of the Brehon laws has recently been published in 17 vols. by the Brehon Laws Commission.

BREISACH, Alt, *âlt brī-zák'*: very old town of the grand duchy of Baden, on an isolated basalt hill on the right side of the Rhine, about 12 m. w. of Freiburg. As early as the time of Julius Cæsar, *Mons Brisiacus* was known as a strong military position, and was taken by Ariovistus when he invaded Gaul. Being regarded as the key to the w. of Germany, it was a prominent scene of action during the Thirty Years' War at the conclusion of which it was ceded to the French. During the

next c., it frequently changed masters, now belonging to France, and now to Austria. The French destroyed its fortifications 1744, and during the war of the Revolution, 1793, part of the town was burned by them. In 1806, the French yielded it to the House of Baden. The minster of St. Stephen is a venerable structure in good preservation, and contains several old monuments. Pop. about 3,800.

BREITENFELD, *brī'tn-fĕlt:* village and manor of Saxony, about 5 m. n. of Leipsic; historically remarkable for three battles on a plain in its neighborhood. The first between the Swedes and the Imperialists, 1631, Sept. 7, was of the highest importance to Europe, as it secured the permanency of Protestantism and the freedom of Germany. Tilly's pride had reached its highest point after the fall of Magdeburg, 1631, May 10; and in the early part of Sept. he advanced against the Saxons, with an army of about 40,000 men, for the purpose of forcing the elector, John George I. (who would not submit to the edict of restitution, and was treating with the Swedish king, Gustavus Adolphus), into an alliance with the emperor. No other way remained than for the elector to join the Swedish king, who had just entered Pomerania. Gustavus Adolphus, joined by the Saxons, advanced toward Leipsic, where Tilly lay, who advanced into the plain of Breitenfeld. The imperial forces were completely defeated, and their three most distinguished generals, Tilly, Pappenheim, and Fürstenberg, wounded. The second battle at Breitenfeld, a second triumph of Swedish valor, 1642, Oct. 23, was between the Swedes, headed by Torstenson, one of the pupils of Gustavus, who had invested Leipsic, and the Archduke Leopold, with General Piccolomini, who was advancing from Dresden to its relief. The Swedes gained a complete victory over the Imperialists, who fled into Bohemia, leaving behind them 46 cannon, 121 flags, 69 standards, and the whole of their baggage. The third battle at Breitenfeld, 1813, Oct. 16, was part of the great contest known as the battle of Leipsic.

BREITHAUPTITE, n. *brī'thŏp-tīt,* [after Professor *Breithaupt*]: antimonial nickel of a light copper-red with a violet-blue tarnish.

BREME, a. *brēm* [AS. *bremman;* Ger. *brummen,* to be furious: L. *frĕmĕrĕ;* It. *bramire,* to growl, to rage]: in *Scot.* and *OE.,* fierce; furious; sharp; severe. BREME'-SOW, a breeding sow, furious or in heat; also BRIM.

BREMEN, *brĕm'ĕn,* Ger. *brā'mĕn:* one of the three free cities of Germany, on the Weser, about 50 m. from its mouth. Pop. (1900) 224,882; nearly all Protestants. Bremen is divided into the Old and the New Town—the former on the right, the latter on the left side of the river, which is spanned by four bridges. The ramparts and bastions round the old town have been levelled and formed into public promenades. Among principal build-

ings, the Cathedral (built about 1160), the Gothic Town-hall (begun about 1405), with its famous wine cellar, said to contain hock of the vintage of 1624, the Exchange, the Museum, the Post-office, and the Observatory of Dr. Olbers, from which he discovered the planets Pallas and Vesta, are remarkable. The position of Bremen makes it the emporium of Brunswick, Hesse, and other countries through which the Weser flows. Besides its excellent water-communication, it is connected by railways with the whole of western and central Germany. Bremen is an exceedingly thriving place, its trade having more than doubled within the last ten years. Large vessels stop at Bremerhaven, where there is a spacious harbor constructed, about 38 m. below Bremen, with which it is connected by electric telegraph. Vessels not drawing more than 7 ft. of water can come up to the town itself. Bremen carries on an extensive commerce with the United States, the West Indies, Africa, the East Indies, China, and Australia. Its great trade, however, is with the United States, from which alone, in a single year, it imported produce of the estimated value of $45,000,000, exporting in return goods to the value of $24,000,000. With the exception of Hamburg, no continental port ships so many emigrants to the United States as Bremen, through its main port at Bremerhaven. The total number of vessels arriving at Bremen 1900 was about 3,500, with a tonnage of about 2,200,000 tons; the tonnage cleared was rather smaller. The number of ships belonging to the port 1901 was 600, with a burden of 634,726 tons. In 1901 the value of the imports amounted to $266,750,000, exports to $251,200,000, whereas in 1858, the imports were valued at only $41,185,000, and the exports at about $40,000,000. The chief imports are tobacco, coffee, sugar, cotton, rice, skins, dye-woods, wines, timber, hemp, etc. The exports are woolen goods, linens, glass, rags, wool, hemps, hides, oil-cake, wooden-toys, etc. Large quantities of tobacco are re-exported. Bremen has manufactures of woolens and cottons, cigars, paper, and starch, and extensive ship-building yards, breweries, distilleries, and sugar refineries. The cigar and sugar manufactures have of late declined, the former on account of increase of duty. Steam communication with N. Y., Hull, Havana, the n. coast of S. America, etc.

Bremen first became of historical note in the 8th c., when it was erected into a bishopric by Charlemagne. It soon attained considerable commercial importance, and became one of the principal cities of the Hanseatic League (q.v.). Having frequently suffered at the hands of the French, it was, 1810, incorporated with that empire; but it recovered its independence 1813, and by the Congress of Vienna was admitted 1815, as one of the Hanse towns, into the Germanic confederation. In 1867, it became a member of the N. German confederation,

and now forms part of the German empire. The area is about 100 sq. m. The government is intrusted to a senate of 18 members, two of whom are chosen burgomasters, and to a municipal council of 150 burgesses elected for six years. The executive power is intrusted to the senate and senatorial committees.

BREMERHAVEN, a port on the Weser, nearly 10 m. from its mouth, was founded by Bremen 1827, on ground acquired from Hanover, and soon became a thriving place. It has extensive docks and quays, and is the seaport of Bremen. Pop. over 20,000.

BREMER, *brē'mėr*, FREDRIKA: 1801, Aug. 17—1865; b. Abo, Finland: Swedish novelist. Her family removed to Sweden when she was only three years old. As a child of eight years she had already begun to write verses; and the works of German poets, Schiller especially, exercised great influence over her youthful imagination. Her original novels first made their appearance under the general title *Tekningar ur Hvardagslifvet*, Stockholm, 1835. It was not, however, till 1842 that the English and American public hailed with delight the appearance, in an English dress, of *The Neighbors*, perhaps the most universally popular of Fredrika Bremer's charming pictures of domestic life in Sweden. Encouraged by its enthusiastic reception, Mrs. Howitt subsequently produced translations of *The Diary*, *The H. Family*, *The President's Daughters*, *Brothers and Sisters*, *Life in Dalecarlia*, and *The Midnight Sun*. In 1849, Miss Bremer visited the United States, and spent two years, passing some time in England on her return. In her *Homes of the New World*, published simultaneously in England, America, and Sweden, 1853, she presents exquisite descriptions of scenery, and vivid pictures of social life, with sound and comprehensive views on political and moral subjects. Returning to her home in Sweden, and saddened by the death of a beloved sister, Miss Bremer devoted her talents and energies to certain philanthropic objects, in which she had throughout life felt deep interest, especially the education of the poorest classes. As a writer of fiction, she is distinguished for feminine delicacy, shrewd sense, humor, deep knowledge of human nature, and a graphic and forcible style. Her works have been translated into almost all the languages of Europe. Her Life and unpublished writings were issued by her sister, 1868.

BRĔN, v. *brĕn* [AS. *brennan*, to burn: Icel. *brandr*, a burning fragment (see BRAND)]: in OE., to burn. BRENNING, imp. BRENT, pp. and pt. burnt.

BREND'AMOUR, *brân-da-moor*, FRANZ ROBERT, German engraver: b. Aix-la-Chapelle, 1831, Oct. 16. He was educated in his art at Cologne under Stephan. In 1856 he went to Düsseldorf and established a xylographic studio, which rapidly became well known and

one of the leading institutions of its kind. He later set up similar studios in Berlin, Leipsic, Brunswick, Stuttgart, and Munich, to conducting which he devoted most of his time. Among his best works are a collection, 112 engravings, after drawings by Rudolf Elster; illustrations for several works, including Immermann's *Der Oberhof* and Count Waldersee's *Der Jäger, The Odyssey,* after drawings by Preller, and eight frescoes in the Rathhaus at Aix-la-Chapelle.

BREN'DAN, or BRENAINN, SAINT, of Clonfert: b. 484 at what is now Tralee in Kerry; d. 577. He was educated under his relative, Bishop Erc, and St. Jarlath of Tuam, and was ordained by the former. Shortly afterward he went on a seven years' voyage in search of the mysterious land far from human ken; but without success. Later he visited and lived in Brittany for a time, and after his return he again set out to seek the distant paradise, which he ultimately found. When he again reached Ireland he founded the monastery of Cluain Fearta (Clonfert), and he seems to have visited Scotland at this time. His two voyages form the basis of the celebrated mediæval legend of the *Navigation of St. Brendan,* but in the legend they are united into one and combined with other stories. Where Brendan's voyages really led him we do not know. The Book of Lismore contains a life of St. Brendan.

BRENDEL, HEINRICH ALBERT, *hīn'rĭH âl'bĕrt brĕn'dĕl:* German painter: b. Berlin, 1827, June 7; d. 1895. He studied at the Berlin Art Academy under Krause, and in Paris as a pupil of Couture and Palizzi. After traveling in Italy and Sicily,. he lived in Paris, 1854–64; he then returned to Germany and lived in Berlin and Weimar, becoming director of the Art School at the latter place. He devoted himself almost entirely to animal painting, and his pictures of sheep are considered especially fine. His works include: *Peasant's Farm, Interior of Sheep Stable, Sheep Leaving Stable.*

BREN'EMAN, ABRAM ADAM: American chemist: b. Lancaster, Pa., 1847, April 28. He was graduated at Pennsylvania State College in 1866, and after service as an instructor, was full professor of chemistry 1869-72. From 1875 to 1882 he was assistant, lecturer, and professor of industrial chemistry at Cornell. Since then he has resided in New York, engaged in professional work as a writer, analyst, and chemical expert. He is the inventor of the Breneman process of rendering iron non-corrosive, and has made a special study of water and its contaminations. He has written: *Manual of Introductory Laboratory Practice* (1875); *Report on the Fixation of Atmospheric Nitrogen* (1890), etc.

BRENHAM, *bren'am:* flourishing town, cap. of

Washington co., Tex.; 126 m. n.w. of Galveston, 93 m. e. of Austin, and about 10 m. w. of the Brazos river, at the intersection of the Gulf Colorado and Santa Fé with the Houston and Texas Central Railroad. The region is fertile, well suited to the growth of cotton, of which large quantities are shipped. It has a number of important manufacturing interests, and is the seat of the Blim Memorial and Evangelical Lutheran Colleges; there are also two parks, fair grounds, a public library, a number of churches, newspapers, etc. Pop. about 4,900.

BREN'NER PASS: pass in main chain of the Alps, on the road between Innsbruck (q.v.) on the n. and Botzen (q.v.) on the s., connecting the s. of Germany with Venice and the n.e. of Italy. The Brenner Pass is the lowest which crosses the main chain of the Alps, the summit being only 4,775 ft. above the sea. Lofty mountains rise above it to the further height of more than 7,500 ft., yet the scenery of the pass is less sublime and less interesting than that of any other of the great passes of the Alps. It is open at all seasons of the year. At the summit of the pass is the village of Brenner, a resting-place for travellers; pop. about 400. The climate here is so severe that grain seldom ripens. Here the traveler finds in close contiguity the Eisach, a small stream, which, after growing to be a considerable river, joins the Adige and the Sill, a tributary of the Inn, one stream flowing to the Gulf of Venice, the other into the Black Sea. A railway through the Brenner Pass was opened 1867, Aug. 18, thus establishing a complete railway line between Germany and Italy. This work was begun by the Austrian government when Venetia belonged to the Austrian empire. The distance from Innsbruck to Botzen in a direct line is only 52 m., but is much longer by the road or the railway.

BRENNUS, *brĕn'us:* name, or rather title of several Gallic princes; probably a Latinized form of the Kymric word *Brenhin*, which signifies a king.

The most famous BRENNUS was that leader of the Gauls who, B.C. 390, crossed the Apennines, and hurrying through the country of the Sabines, at the head of 70,000 men, encountered and overthrew on the banks of the Allia (q.v.) the Roman army. Had the barbarians immediately followed up their advantage, Rome might have been obliterated from the earth; but instead of doing so, they abandoned themselves to drunken delights on the battlefield, and gave the Romans time to fortify the Capitol, whither were removed all the treasures and holy things of the city. When Brennus entered the gates, he found that all the inhabitants had fled, with the exception of the women, children, and old men, the last of whom, with pathetic heroism, had resolved not to survive the destruction of

their homes, and so, the chief among them, clothed in their robes of sacerdotal or consular dignity, and sitting in the curule chairs, waited the approach of their enemies, and received their death in majestic silence. Brennus, having plundered the city, now besieged the Capitol for six months. During the beleaguerment occurred the famous night-attack, which would have been successful had not the cackling of the geese, kept in Juno's temple, awakened the garrison. At length, however, the Romans were compelled to enter into negotiations with the besiegers. They offered 1,000 lbs. of gold for their ransom, which was agreed to. According to Polybius, Brennus, and his Gauls returned home in safety with their booty; but the rather mythical Roman traditions affirm that, just as the Gauls were leaving the city, Camillus, who had been recalled from banishment, and appointed dictator, appeared at the head of an army, attacked them, and, in two bloody battles, slew the whole of the barbarians to a man.

Another BRENNUS, conspicuous in history, was that Gallic chief who invaded Greece, B.C. 279, at the head of 150,000 foot and 61,000 horse. After desolating Macedonia, Brennus forced his way through Thessaly to Thermopylæ. The Grecian army fled at his approach. Brennus now rushed on with a division of his great host to Delphi, which he had resolved to plunder, but the Delphians, having taken up a very advantageous position on some rocks, resisted his further progress. Assisted by the terrors of an earthquake and a terrible storm, besides, according to reverential tradition, by the supernatural help of Apollo, they utterly routed the Gauls, who fled in dismay. Brennus was taken prisoner, and drank himself to death in despair.

BRENT, CHARLES HENRY, an American clergyman; b. 1862, in Newcastle, Ontario; educated at Trinity College School at Port Hope and at Univ. of Trinity College, Toronto; ordained in Prot. Epis. Church 1887. His first clerical work was at St. Paul's Pro-Cathedral, Buffalo; later went to High Church Parish of St. John the Evangelist, Boston, under Father Hall. When the latter was elevated to the bishopric in 1891 Brent was transferred to St. Stephen's Church, where he labored among the poor. In 1901, Oct., he was nominated missionary bishop of the Philippines, and Dec. 19 following was consecrated. He was given $100,000 to erect a cathedral, school and Bishop's house in Manila. He was on the staff of the New York *Churchman* 1897–1900, and has written: *With God in the World* (1899); *The Consolations of the Cross* (1902); *The Splendor of the Human Body* (1904); etc.

BRENTANO, *brĕn-tâ-nō*, CLEMENS: 1778–1842, July 28, b. Frankfort-on-the-Main: novelist and dramatic poet; brother of Goethe's 'Bettina.' He studied at Jena; afterwards resided successively at Frankfort,

Heidelberg, Vienna, and Berlin. In 1818, through a morbid discontent with himself and his fellow-men, he retired to the cloister at Dülmen, in Münster. Latterly, he resided at Regensburg, Munich, and Frankfort-on-the-Main, where he led the life of a recluse, and gained considerable reputation for sarcastic wit. He died at Aschaffenburg. In his earliest poems the peculiarities of the 'romantic school' of his time are carried to excess. His dramatic productions, such as *The Merry Musicians, a Musical Drama* (Frankfort, 1803), in which there are some gems of lyric poetry, *Ponce de Leon* (Göttingen, 1804), etc., are characterized by great dramatic power, amusing though rather far-fetched wit and a wonderful flow of humor. Perhaps his most successful piece as a drama is *The Founding of Prague* (Pesth, 1816). Brentano was most successful in his smaller novels, particularly in the *History of Casper the Brave and the Fair Annerl* (2d ed. Berlin, 1831), which German critics call a '*chef-d'œuvre* in miniature.' His last work the legend of *Gokel, Hinkel, and Gakeleia* (Frankfort, 1838), was intended as a satire upon the times in which he lived.

BRENTANO, Franz, German philosopher; b. Marienberg, 1838, Jan. 16. He was professor of philosophy at Würzburg, but in 1873 resigned his position on account of the doctrine of the infallibility of the Pope; and was professor at Vienna, 1874–80. He has written *Psychology of Aristotle, New Riddles,* and *Psychology from an Empirical Standpoint* (in agreement with Lotze and the English empirical psychologists).

BRENTANO, Lorenz, German politician; b. Mannheim, 1813, Nov. 4; d. Chicago, 1891, Sept. 18. He studied law at Heidelberg, represented Mannheim in the Lower House of Baden, and was a member of the National Assembly in 1848. He withdrew from this body with the majority of the radical party in 1849. He was placed at the head of the revolutionary government of Baden, but suspected of treachery to his party, was forced to flee to Switzerland. In 1850 he came to the United States, lived for a time on a farm in Michigan, and then went to Chicago. Here he practised law and established the Illinois *Staatszeitung*, which he made one of the most influential papers in the northwest in the interest of the Federal government. He was a member of the Illinois legislature in 1862; United States consul at Dresden 1872–6, and member of Congress from Illinois in 1876.

BRENTANO, Lujo, German political economist; b. Aschaffenburg, Bavaria, 1844, Dec. 18. He studied at Dublin and at four German universities; and, after attaining a post in the Royal Statistical Seminary in Berlin, went to England to study the condition of the working classes, and especially trades' associations and

unions. The outcome of this was his work, *On the History and Development of English Guilds* (1870); *Die Arbeitergilden der Gegenwart* (1871–2). He has been professor at Breslau (1873), Strasburg, Vienna, Leipsic, and since 1891 professor of political economy at the University of Munich. He supports the Socialists of the Chair (*Kathedersozialisten*) against the German free-trade school, and has written works on *Wages* (1877); *Labor in Relation to Land* (1877); *Compulsory Insurance for Workmen* (1881), on the English Chartists, on the Christian Socialist movement in England; *Uber das Verhältnis von Arbeitslohn und Arbeitszeit zur Arbeitsleistung* (1893); *Agrarpolitik* (1897); *Gesammelte Aufsatze* (1899); *Ethik und Volkswirtschaft in der Geschichte* (1901); *Die wirtschaftlichen Lehren des christlichen Altertums* (1902); *Das Freihandelsargument* (1900); *Die Schrecken des überwiegenden Industriestaats* (1901); *Die Getreidezolle als Mittel gegen die Not der Landwirte* (1903); *Münchener Volkswirtschaftliche Studien*, 1–65, *Stück* (1893–1904); etc.

BRENTFORD, *brĕnt'furd:* co. town of Middlesex, Eng., on both sides of the Brent, at its confluence with the Thames, 7 m. w.s.w. of London, and where the Thames is crossed by a bridge leading to Kew. It consists chiefly of one long irregular street. It has large gin-distilleries, a soap-work, and sawing and planing mills. There are many market-gardens in the vicinity. Here Ironside defeated the Danes 1016, after expelling them from London; six martyrs were burned at the stake, 1558; the Royalists under Rupert defeated the Parliamentarians under Colonel Hollis, 1642. Pop. 15,171.

BRENT-GOOSE, n. *brĕnt'gôs* [Icel. *brandgás*, a brent-goose: comp. Ger. *halber ente*, a half-duck]: sometimes called Brent Barnacle, a migratory sea-bird; the smallest species of geese: see under Barnacle Goose.

BRENTON, *brĕn'tŭn*, William, colonial governor; b. England, early in 17th c.; d. Newport, R. I., 1674. His family came to Rhode Island from Hammersmith, England, where they were of good social standing. Between 1635 and 1669 Brenton was the colony's representative at Boston, lieutenant-governor, president of the colony, and governor under the Charles II. charter 1669–9. He was one of the nine original proprietaries of Rhode Island; he selected and surveyed the site of Newport, and built a large brick residence where Fort Adams now stands. Brenton's Point and Brenton's Reef in Narragansett Bay preserve his name. See Rhode Island Colonial Records, vols. I. and II., *passim*.

BRENZ, *brĕnts*, Johann, *yō'hân*, German reformer; b. 1499; d. 1570. He was one of the authors of the *Syngrammá Suevicum*, bearing upon the controversy with Zwingli and Œcolampadius, on the subject of the Lord's

Supper. He was the most resolute among the opponents of the interdict of Charles V., escaping death only by resorting to flight.

BRERETON, *brĕr'tŭn,* AUSTIN, English journalist: b. Liverpool, England, 1862, July 13. He went to London in 1881, has been dramatic critic of *The Sphere* from 1901, and prior to that date was connected with *The Stage; The Theatre;* Sydney (N. S. W.) *Morning Herald;* and the *Illustrated American,* New York. He has published Henry Irving's *A Biographical Sketch* (1883); *Some Famous Hamlets* (1884); *Dramatic Notes* (1886); *Shakespearean Scenes and Characters* (1886); *Romeo and Juliet on the Stage* (1890); *Sarah Bernhardt* (1891); *Gallery of Players* (1894); *Short History of the Strand Theatre* (1899); *Cheltenham* (1899); *By the Silent Highway* (1901); *Peg Woffington, On and Off the Stage* (1901); *The Well of St. Anne* (1901); *A Ramble in Bath* (1901); *The Lyceum and Henry Irving* (1903); etc.

BRESCIA, *brĕsh'ē-a,* or *brĕsh'â,* or BRESCIANO: province in Lombardy, Italy, bounded by Lago di Garda on the e., and separated from Austria on the n. by the Tyrol Mountains; 1,784 sq. m. A chain of the Rhætian Alps occupies the n. part; but about two-thirds of the province lies in the fertile and beautiful plain of the Po. It is drained by the Olio, the Mella, and the Chiese rivers, three tributaries of the Po. The vegetable products are grapes, olives, corn, flax, and hemp. Copper, iron, granite, marble, and alabaster, are obtained from the mountains. There are manufactures of copper, iron, steel, glass, wool, silk, cotton, and paper. The principal towns are Brescia, the capital, Chiari, Monte-Chiaro, Pontevico, Orzinnova, Salo, and Rovato. Pop. 538,427.

BRESCIA, *brĕsh'ē-a:* city of Italy, capital of the province of Brescia, in Lombardy, about 60 m. e.n.e. of Milan. It is romantically situated on the rivers Mella and Garza, in a wide, fertile plain, at the base of several hills. The railway from Milan to Venice passes through Brescia. The city is for the most part regularly built, and, besides two cathedrals, the old and the new, it has numerous ancient churches, adorned with pictures and frescoes, including many by masters of the Venetian school. The other buildings most worthy of notice are the Palazzo della Logia, and the Broletto. The first was intended for the palace of the municipality, or city hall. It is composed of the richest marbles, and was worked upon by the first architects of the 15th and 16th c. successively. The Broletto, the ancient palace of the republic, combines the characters of fortress and city hall, and is surmounted by a great tower. The city contains also a lyceum, two gymnasia, an athenæum, a college, with a museum of antiquities, and a botanic garden; a public library, with 30,000 volumes; a theo-

logical seminary, a handsome theatre, a corn exchange, an extensive hospital, and other educational and charitable establishments. There are 72 public fountains in the streets and squares, besides some hundreds of private ones. Outside the town is a cemetery, begun in 1815, designed by Vantini.

Brescia is a place of considerable trade and manufacturing industry. Near it are large iron-works, and its firearms are esteemed the best that are made in Italy. It has also silk, linen, and paper factories, tan-yards, and oil-mills, and is an important mart for raw silk. But it derives its greatest interest from its fine Roman remains. Some remarkable discoveries have been made, embracing besides numerous statues and inscriptions the beautiful marble temple of Vespasian, and a number of noble and magnificent Corinthian columns. The city became the seat of a Roman colony under Augustus about 15 B.C., and afterward a municipium. In 412 it was burned by the Goths; and was soon afterwards destroyed by Attila; but was rebuilt about 452. It was taken by Charlemagne in 774. In 936 Otho I. of Saxony declared it a free city, it so remained for nearly three c., and ultimately put itself under the protection of Venice in 1426. In 1796 it was taken by the French, and was assigned to Austria by the general treaty signed at Vienna, 1815, June 9. In 1849 it was involved in the commotions of continental Europe; its streets were barricaded, but the city was eventually captured by the Austrians under Gen. Haynau. It was ceded to Sardinia by the Treaty of Zürich in 1859. Pop. (1901) 70,618.

BRESLAU, *brĕs'low:* capital of the province of Silesia, Prussia, at the confluence of the Ohlau and Oder; next to Berlin the most populous city in Prussia. More than half the people are Protestants. The Oder divides it into two parts, connected by numerous handsome bridges. The fortifications have been converted into beautiful promenades, and the ditch has been transformed into an ornamental sheet of water. The streets of the new portion of Breslau are spacious and regular, and the houses stately and handsome, a pleasant contrast to the sombre, massive structures of the old town. Educational institutions are numerous, including a university founded by the Emperor Leopold I., 1702, and now accommodating 900–1,000 students. The library contains 300,000 vols. Breslau has many churches, the most remarkable being the Protestant church dedicated to St. Elizabeth, with a steeple 298 ft. in height (the highest in Prussia), and a splendid organ. The situation of Breslau, in the centre of the manufacturing districts of the province, secures it a large trade, which its railway connection with all the important cities on every side, in addition to the facilities of communication which the Oder affords, enables it to turn to the best account. It has manufactures of linen, woolens, cotton, silks, lace,

jewelry, machines, earthen-ware, soap, alum, starch, etc., and upward of 100 distilleries; and a trade in grain, coal, metals, timber, hemp, and flax. Breslau is a city of Slavonic origin, and was for many c. occupied alternately by the Poles and the Bohemians. It afterward passed to Austria, from which it was taken by Frederick II. of Prussia, 1741. Six years afterward, it was captured by the Austrians, after a bloody battle, but retaken by Frederick in about a month. From that time until 1814, when its fortifications were completely demolished it was frequently besieged. Pop. (1900) 422,709.

BRESSAY, *brĕs'sā:* one of the Shetland Isles, e. of the mainland, and separated from Lerwick by Bressay Sound. It is 6 m. long and 2 broad, and is composed of Devonian rocks. It supplied Lerwick with peat, until the proprietor, fearing that the peat might be exhausted, stopped exportation; and it continues to supply the Shetland Isles with slates. Pop. (chiefly fishermen) about 1,700.

Bressay Sound is one of the finest natural harbors in the world, and is a rendezvous for herring-boats, and for all whalers and other vessels proceeding north. East of Bressay, and separated from it by a narrow and dangerous sound, is a rocky isle, called Noss, 6 m. in circuit, girt on all sides by perpendicular cliffs, and rising abruptly from the sea to the height of nearly 600 ft., with a flattish top. A detached rock, or holm, on the s.e. side of the Noss, used to be communicated with by means of a cradle or wooden chair run on strong ropes, stretched across a yawning gulf, and admitting a man with a sheep to be drawn over at a time.

BREST: strongly fortified city, in the dept. of Finistère, France; one of the chief naval stations of the country; lat. 48° 24′ n., long. 4° 29′ w.; on the n. side of the Bay or Road of Brest, which forms one of the finest harbors in the world. The only entrance to the bay is by a narrow channel called *Le Goulet*, which is scarcely a mile wide, and is strongly defended by batteries; the difficulty and danger of access to hostile ships being increased by certain rocks in the centre of the channel. A new floating dock, quays, and pier were completed 1876 at a cost of 22,500,000 francs. The small river Penfel flows through the town, which is, on the whole, irregularly built on an uneven site, and has steep, narrow, dark, and very dirty streets. In some parts, communication between the lower and upper parts of the town can be effected only by stairs. The new quarter, the parade, and the quays, are more cleanly. Brest has extensive ship-building yards, rope-walks, store-houses, etc.; its industry, indeed, is confined entirely to the equipment of the navy in its various branches. It has telegraphic communication with America by a submarine cable. The Bagnes (q.v.) or hulks no longer exist, the

prisoners having been removed to the penal colony of Cayenne. Brest is a very ancient place, but it was not of much importance until the 17th c. Its admirably defensive position made it an object of contention to French, English, and Spaniards. In 1631, Cardinal Richelieu resolved to make it a naval station, and commenced the fortifications, completed by Vauban, but since greatly extended. In 1694, the English under Lord Berkeley were repulsed here with great loss. In 1794, the French fleet, under Admiral Villaret-Joyeuse, was defeated off Brest by the English fleet under Admiral Howe. Pop. (1903) 75,854.

BREST-LITOVSK, *brĕst-lē-tŏvsk':* town of Russian Poland, 131 m. s. of Grodno; lat. 52° 5′ n., long. 23° 27′ e.; at the confluence of the Mukhovetz and the Bug. As two very important railroads intersect here, the trade by river, canal, and railroad is extensive. Brest-Litovsk has a fortress, and a military school, and is the seat of an Armenian bishopric. It has tanneries, and manufactures of cloth. It is noted for the victory of Souwaroff over the Poles 1791. Pop. (1903) 47,000.

BREST-SUMMER, or BREAST-SUMMER, *brĕst'-sŭm-mĕr*, or BRESSUMMER, n. *brĕs'sŭm-mĕr* [*breast*, and W. *swmer*, a beam (see SUMMER 2)]: a beam of wood or iron introduced into the front or external walls of a building to carry the weight of an upper structure—used principally over shop-windows.

BRETAGE, n. *brĕt'āj:* see BRATTICE.

BRETAGNE, *brē-tâñ'*, or BRITTANY, *brĭt'a-nĭ* (*Britannia Minor*): a peninsula in the n.w. of France, formerly a province, and now divided into the depts. of Finistère, Côtes-du-Nord, Morbihan, Loire-Inférieure, and Ille-et-Vilaine; surrounded by the sea on the n., w. and s.w. Though the height of the mountains is nowhere considerable, their structure gives the peninsula a wild and savage aspect. Clay-slate forms the centre of the country, and masses of granite rise in the n. and s. The climate is often foggy, and subject to violent storms of wind. Large tracts of land lie uncultivated; but in the well-watered valleys vegetation is luxuriant. In ancient times, Bretagne, under the name of Armorica, was the central seat of the confederated Armorican tribes, who were of Celtic and Kymric origin. Traces of them remain in the old Kymric dialect of the three most westerly departments, and in the numerous so-called Druidical monuments. The name *Armorica* was changed for that of Bretagne, in consequence of the numerous immigrations from Great Britain in the 5th and 6th c. The peculiar, shut-in situation, and the characteristics of soil and climate in Bretagne, seem to have had a powerful effect on the character of its people. The Breton has generally a tinge of melancholy in his disposition; but often conceals, under a dull and indifferent exterior, a lively imagination and strong feelings. 'The

tenacity with which the Breton clings to the habits and belief of his forefathers, is apparent by his retention of the Celtic language almost universally in Basse Bretagne, and by his quaint costume, which in many districts is that of the 16th c.' The greater number of the people are found to be ignorant and coarse in their manners, and their agriculture is very rude and unfitted to develop the natural resources of the country. Until recent years, Bretagne had escaped the observation of tourists; but it has now been found out, and seems likely to be considerably visited and written about. It will be some time yet before it is exhausted, and, apart from the beauty of its scenery, it has great interest as the only place where men can be seen living and acting much as our forefathers did three centuries ago. Under the Romans, the country, after B.C. 58, was made the *Provincia Lugdunensis Tertia;* but its subjugation was hardly more than nominal, and it was entirely liberated in the 4th c., when it was divided into several allied republican states, afterward changed into petty monarchies. Bretagne became subject to the Franks in the reign of Charlemagne, and was handed over by Charles the Simple to the Northmen 912. After some fierce struggles, the Bretons appear to have at length acknowledged the suzerainty of the Norman dukes. Geoffroi, Count of Rennes, was the first to assume the title of Duke of Bretagne 992. The duchy of Bretagne was incorporated with France 1532, by Francis I., to whom it had come by marriage, and subsequently shared in the general fortunes of the empire, but retained a local parliament until the outbreak of the Revolution. During the Revolution, Bretagne, which was intensely loyal, was the arena of sanguinary conflicts, and especially of the movements of the Chouans (q.v.), who reappeared as recently as 1832. Daru, *Histoire de Bretagne* (Par. 1826); Roujoux, *Histoire des Rois et des Ducs de Bretagne* (Par. 1829); Courson, *La Bretagne du* 5e *au* 12e *Siècle* (1863); Le Saint, *La Bretagne Ancienne et Moderne* (1873); De Kerorguen, *Recherches sur les Etats de Bretagne* (1875).

BRETFUL, a. *brĕt'fûl* [an assumed corruption of OE. *breed*, the brim of a hat: Scot. *breid*, broad]: in *OE.*, full up to the brim; quite full.

BRETHREN, n. plu. *brĕth'rĕn* [plu. of BROTHER, which see]: members of the same society or profession.

BRETHREN AND CLERKS OF THE COMMON LIFE, or, of the COMMON LOT: see BROTHERHOODS, RELIGIOUS.

BRETHREN OF THE CHRISTIAN SCHOOLS: an order organized at Rheims 1679, whose object it was to furnish instruction for the poor. It was sanctioned by Benedict XIII., 1725. At Paris, they refused to take the oath to obey the civil constitution in 1792, and hence were expelled from their houses and forbidden to teach. They returned 1801, and soon became numerous in France,

Italy, and other countries. The members take upon themselves the vows of chastity, poverty, and obedience. Their costume is a coarse black cassock, and a small collar or band around the neck, for the house, and a hooded cloak and a wide hat for outdoor purposes. Their teaching is mainly rudimentary, although in some of their schools Latin and the higher mathematics form part of the course. They have modified their instruction from time to time to make it meet the wants of the classes whom they teach. Thus, in 1831 they opened evening schools for adults, wherein they received and taught mechanics and other poor laborers who had no time to devote to learning in the day. The Brethren of the Christian Schools are sometimes improperly called the Christian Brothers. The latter have nearly the same rule and object, but form an independent order. See BROTHERS OF THE CHRISTIAN SCHOOLS.

BRETHREN OF THE FREE SPIRIT: a sect which sprang up on the upper Rhine near the beginning of the 13th c. They are frequently confounded with the Lollards, Beguards, or Beguins. They held that the universe was a divine emanation; that man, so far as he gave himself to the contemplative life, was a Christ, and as such free from law, human or divine (Romans viii. 2, 14). Many edicts were published against this sect, but it continued to exist under various names, such as Picards and Adamites, till about the first quarter of the 15th c.

BRETHREN OF THE HOLY TRINITY: a religious society, founded in France near the close of the 12th c., whose members pledged themselves to give a third part of their revenues to procuring the redemption of Christians who had fallen captive to the infidels, and were in Mohammedan slavery. It was established by John of Matha, a Parisian theologian, and Felix de Valois.

BRETHREN, WHITE: sect of the 15th c., that arose in the Alps of northern Italy. Their leader pretended to be the prophet Elias; they wore white apparel, and carried crucifixes from which blood appeared to issue. Their leader, whose name is unknown, prophesied that the end of the world was at hand; and met with success for a while; but Boniface IX. caused him to be arrested and burned at the stake, and in less than a year the sect had ceased to exist.

BRETIGNY, *brā-tēn-yē′:* village of France, dept. of the Eure-et-Loir, about 6 m. s.e. of Chartres, on the railway between Paris and Orleans. Bretigny is celebrated as the place where, 1360, Edward III. concluded a peace with France, by which John II. of France was released from his captivity in England, on agreeing to pay three million crowns for his ransom. Edward renounced his claim to the crown of France, and relinquished a portion of his conquests and possessions in that country, including Anjou and Maine, and the greater

part of Normandy; receiving the cession in independent sovereignty of the duchy of Aquitaine, with all its dependencies; Gascony, Poitou, Saintonge, Aunis, Agenois, Périgord, Limousin, Quercy, Rouergue, Angoumois, together with Calais, the counties of Ponthieu and Guines, and the viscounty of Montreuil.

BRETON, n. *brĭt'ŭn*, pertaining to BRITTANY, or BRETAGNE, in France.

BRETON, JEAN BAPTISTE JOSEPH, *zhŏn bâptēst zhōzĕf brĕ-tôñ*, French journalist: b. Paris, 1777, Nov. 16; d. 1852, Jan. 6. His public career as journalist and stenographer was nearly parallel with representative government in France. He was present as stenographer at the session of 1792, Aug. 10, when the power passed from the hands of an individual to those of an assembly; and of 1851, Dec. 2, when it passed from the hands of an assembly to those of an individual. His services were also in constant requisition at the courts as an interpreter for English, German, Italian, Spanish, Dutch, and Flemish suitors. He was a frequent contributor to the *Dictionnaire de la Conversation*, and among other papers wrote the article on stenography.

BRETON, JULES ADOLPHE, *zhûl â-dōlf*, French painter: b. Courrieres 1827, May 1; d. Paris, 1906, July 5. He was educated at St. Omer and at Douai, and trained as a painter under Félix Devigne at Ghent, and at Drölling's *atelier* in Paris. The subjects of his earlier pictures, such as *Misère de Désespoir* (1849), are taken from the French revolutionary period; but he soon turned to the scenes from peasant life which he treated in a most poetic and suggestive manner, with an admirable union of style with realism. In 1853 he exhibited *La Retour des Moissonneurs* and in 1855 his celebrated *Les Glaneuses*. He is represented in the Luxembourg by *La Bénédiction des Blés* (1857), admirable for its rendering of sunlight; *Le Rappel des Glaneuses* (1859); and *Le Soir* (1861). His later works are simpler in their component parts and larger in the scale of their figures, and of these *La Fontaine* is a typical example. Breton was also known as a poet.

BRETON DE LOS HERREROS, *brā-tōn' dā lōs ĕr-rā'rōs*, DON MANUEL: 1800, Dec. 19—1873, Nov.; b. Quel, province of Logroño: most popular of modern Spanish poets. He received his earliest education in Madrid; and served as a volunteer in the army 1814–22. Subsequently he held several situations under government, but always lost them on account of his expression of liberal opinion. As early as his 17th year he wrote a comedy entitled *A la Vejez Viruelas*, which, 1824, was brought upon the stage with great success. Thenceforward he furnished theatrical managers with more than 150 pieces, partly original, partly adaptations from the older Spanish classics, and partly translations from the Italian and French, most of which have been highly

popular. In addition to these, Breton published *Poesías Sueltas* (Madrid, 1831, and Paris, 1840); several volumes of satirical verse; a long humorous poem, called *La Desvergüenza, Poema Jocoserio* (Madrid, 1858), etc. All Breton's poems are remarkable for their singularly sweet, yet powerful diction, and for the harmony of the versification. His peculiar sphere is the comic and the satirical, in which the Spanish or national qualities of his genius find their freest expression, and in which also he displays most ease and self-reliance. Breton superintended the issue of a collected edition of his poetical works 1850–52 (5 vols., Madrid). He died at Madrid.

BRETSCHNEIDER, *brĕt shnī-dĕr*, HEINRICH GOTTFRIED: 1739, Mar. 6—1810, Nov. 1; b. Gera, Germany. He was sent for education to the Institute of Herrnhuters at Elbersdorf, afterward to the Gymnasium at Gera. He became captain of horse in a Prussian volunteer corps, in which service he was made prisoner, and retained in a French fortification till 1763. In 1775 Bretschneider visited England, France, and Holland; and in 1778 was nominated librarian to the Univ. of Ofen, where he was persecuted by the Jesuits, whose hatred he had excited. This brought him under the notice of Joseph II., who, 1782, appointed him one of the inspectors of studies. Bretschneider was the author of tales, poems, and satires. The latter are attacks upon every kind of injustice and falsehood. In his 'Almanac of the Saints (*Almanach der Heiligen*) for the year 1788, with Copperplates and Music, printed at Rome, with the permission of the Principals,' the priesthood is severely attacked, and the legends of the monks ridiculed. Like Nicolai, Bretschneider was very bitter against the 'Werther' mania prevalent in his time.

BRETSCHNEIDER, KARL GOTTLIEB: 1776, Feb. 11—1848, Jan. 22; b. Gersdorf, Saxony: German theologian. He studied theology at Leipsic, was appointed pastor at Schneeberg 1807, general supt. at Gotha 1816, and 1840 obtained the dignity of councilor of the upper consistory. Bretschneider has a reputation for sober, reflective, rationalistic thought. The character of his intellect rendered him unable to enter into the profound speculations of men like Schleiermacher and Schelling; but nevertheless by his diligence, clear, incisive understanding, and strength of character, he secured a permanent place in the history of German theology. His most important work in dogmatics is the *Manual of the Evangelical Lutheran Church* (2 vols., Leip. 1814–18). In 1824, Bretschneider published *Lexicon Manuale Græco-Latinum in Liberos Novi Testamenti* (2 vols., Leip. 1824). In 1832, appeared *Der Simonismus und das Christenthum;* in 1835, *Die Theologie und die Revolution.*

BRETT, n. *brĕt:* a short term for britzska, a four-

wheeled carriage having a calash top and seats for four besides the driver's seat.

BRET'TEN: town of Baden, about 13 m. e. of Carlsruhe, noteworthy chiefly as the birthplace of Melanchthon. The house in which he was born is pointed out to travelers. Pop. 4,800.

BRETTICE: see BRATTICE.

BRETTS AND SCOTS, THE LAWS OF THE (Lat. *Leges inter Brettos et Scotos,* Old Fr. *Lusage de Scotis et de Bretis*): name given, in the 13th c., to a code of laws in use among the Celtic tribes in Scotland. The 'Scots' were the Celtic people dwelling in the w. and more mountainous districts n. of the Forth and the Clyde, who, when it became necessary to distinguish them from the Teutonic inhabitants of the low country, received the names of 'the Wild Scots,' 'the Irishry of Scotland,' and, more recently, 'the Scotch Highlanders.' The 'Bretts' were the remains of the British or Welsh people, who were at one time the sole or chief inhabitants of the region now divided into the shires of Dumbarton, Renfrew, Ayr, Lanark, Peebles, Selkirk, Roxburgh, Dumfries, and Cumberland. This province was for some centuries an independent kingdom, known by the names of 'Cambria,' 'Cumbria,' 'Strathclyde,' and 'Strathclyde and Reged.' It became, about the middle of the 10th c., a tributary principality held of the king of the English, by the heir of the king of the Scots. It so continued till after the beginning of the 12th c., when Cumberland having been incorporated with England, the gradual absorption of the rest of the territory into the dominions of the king of the Scots seems to have been imperceptibly completed. The last 'Prince of Cumbria' named in record was the brother and heir of King Alexander I. of Scotland, 'the Earl David,' as he was called, who, on his brother's death 1124, himself became king of the Scots. No more is heard of Cumbria as a principality; but 'the Welsh' continue to be named among its inhabitants in the charters of King David's grandsons—King Malcolm the Maiden (1153–65), and King William the Lion (1165–1214). And they seem to have retained more or less of their ancient Celtic laws until after the beginning of the 14th c. It was not until 1305 that an ordinance of King Edward I. of England, who appeared then to have reduced all Scotland to his subjection, decreed 'that the usages of the Scots and the Bretts be abolished, and no more used.' It is unknown how far this prohibition took effect. Of the code which it proscribed, only a fragment has been preserved. It was printed first by Sir John Skene, in his *Regiam Majestatem* (Edin. 1609). But by far the best edition is that of Mr. Thomas Thompson and Mr. Cosmo Innes, in the *Acts of the Parliaments of Scotland,* vol. i., pp. 299–301 (Edin. 1844), where the laws are given in three languages—Latin, French, and English. The French

version, which is the oldest, is printed from a manuscript of about 1270, formerly in the public library at Bern, Switzerland, now in the Register House at Edinburgh. The fragment of the 'laws of the Bretts and the Scots' thus published, is of much the same nature as the ancient laws of the Anglo-Saxons, the Welsh, the Irish, and other nations of w. Europe. It fixes the *cro*, or price at which every man was valued, according to his degree, from the king down to the churl, and which, if he were slain, was to be paid to his kindred by the homicide of his kindred. The cro of the king was 1,000 cows; of the king's son, or of an earl, 150 cows; of an earl's son or of a thane, 100 cows; of a thane's son, 66⅔ cows; of the nephew of a thane, or of an ogthiern, 44 cows and 21⅔ pence; and of a villain or churl, 16 cows—all persons of lower birth than a thane's nephew, or an ogthiern, being accounted villains or churls. The cro of the married woman was less by a third than the cro of her husband. The cro of the unmarried woman was as much as the cro of her brother. Other chapters fix every man's *kelchyn* or *gelchach*, *gallnes*, and *enauch*—Celtic terms not yet satisfactorily interpreted, but apparently equivalent to the *fyhtwite*, *mund*, and *manbot* of the Anglo-Saxons, as the *cro* of the Bretts and Scots appears to answer to the *wergild* of the English. A chapter 'of blood-drawing'—corresponding with the *blodwyte* of the Anglo-Saxons—fixes the fine to be paid for a blow to the effusion of blood, according to the degree of the person wounded and the place of the wound.

BRETZEL, *brĕt'sel* [Ger.] a hard brittle cake covered with salt, usually written Pretzel.

BREUGHEL, *bruh'gel* or *bruh'hėl:* name of a famous family of Dutch painters.

Peter Breughel: 1510 (or 30)–1569; head of the family; b. in the village of Breughel, near Breda; d. Brussels. He was a scholar of Peter Koeck van Aelst, travelled through Italy and France, and on his return, fixed his residence at Antwerp. He painted chiefly the pleasures of rustic life, for which he had a great relish, and which he transferred to his canvas with clear insight and vivid coloring, though unnecessarily exceeding at times the coarseness of his subject. He also executed several historical pieces, such as his *Building of the Tower of Babel*, now preserved in the gallery at Vienna.

His son, Peter Breughel: 1559–1625: distinguished by the strange title 'Hellish Brueghel'—because he loved to paint scenes in which the leading characters were devils, hags, robbers, etc. His paintings of *Orpheus*, and the *Temptation of St. Antony*, are the most remarkable of his pieces.

Jan Breughel: 1569–1625; another son; on account of the splendid apparel which he wore when he became rich, usually called Velvet Breughel. He was an industrious painter, distinguished for his landscapes and

for his minute finish of small figures. In concert with Rubens, who supplied the two chief figures, he painted *Adam and Eve in Paradise*, and *Vertumnus and Bellona*. These with the *Four Elements*, are his chief works.

Other members of the same family were known as painters: AMBROSE BREUGHEL, director (between 1635–70) of the Acad. of Painting, Antwerp; ABRAHAM BREUGHEL, painter of fruits, flowers, and birds, lived long in Rome and Naples, where he died 1690; JAN BAPTIST BREUGHEL, b. Rome, d. 1700; flower-painter; finally, CASPAR BREUGHEL, flower-painter.

BREVE, n. *brēv* [It. *breve*—from L. *brĕvis*, short]: note in music, which in the old notation of Guido d'Arezzo, had the value of two whole bars. It is written thus, , or , or . The note for a whole bar in modern notation is called semibreve, and has the value of four crotchets. In triple time the breve contained three semibreves. The breve is now used only in *a la capella* movements, psalm-tunes, and fugues, or at the close of a composition; the mark (◡) in printing, placed over a vowel to indicate its quantity or its quality of sound; a letter of state; a short note or minute; a kind of writ; see also brief for three last meanings.

BREVE: see ANT-CATCHER.

BREVE, or BRIEVE, in the practice of the Scotch Law: a writ issuing from chancery in the name of the crown, to a judge, ordering him to try by jury the points or questions stated in the breve. In ancient times, these writs appear to have been the foundation of almost all civil actions in Scotland; they are now used in only a few special cases.

BREVET, n. *bre-vĕt* [F. *brevet*, a commission—from mid. L. *brevētum*, a papal brief or letter—from L. *brĕvis*, short]: the commission which confers on an officer the nominal rank next higher to the one which he holds, but which does not entitle him to the increased pay. Brevets were conferred in the U. S. army in great number during and at the end of the rebellion. In the British army, they were given in immense numbers before 1854, at which date general brevets were abolished, and they are now conferred more sparingly and for services (see COMMISSIONS, ARMY): ADJ. taking rank by brevet. BREVET'CY, n. *-sĭ*, the rank or condition of a brevet commission.

BREVIARY, n. *brē'vĭ-ĕr-ĭ* [F. *bréviarire*, a breviary: L. *brĕvĭārĭum*, an abridgment or abstract, in *mid. L.*, a manual of daily prayers—from L. *brĕvis*, short: It. *breviario*]: an abridgment; a manual of daily prayers; the book containing the daily service of the Rom. Cath. Church. The Breviary is an *abbreviation*, as well as an amended arrangement of the more ancient offices used at the Seven Canonical Hours, which are Matins, Prime, Tierce, Sext, Nones, Vespers, and Compline: see CANON-

ICAL HOURS. The books in which these offices were contained were formerly distinct—viz., 1. The *Psalter*, which included the Psalms of David according to St. Jerome's Galbian version, the Te Deum, the Athanasian Creed, etc.; 2. The Bible; 3. The *Antiphonarium*, containing the anthems and responsories; 4. The *Hymnarium;* 5. The *Collectarium*, or the collects to be said at the end of the services; 6. The *Homilarium*, *Passionarium*, and *Martyrologium*, containing the comments of the Fathers upon the gospel of the day, and accounts of the martyrdoms of the saints for each distinct festival. Out of all these separate books, the Breviary was compiled, about the 11th c., by Pope Gregory VII., as is supposed; the lessons, anthems, hymns, and responsories for the different days of the year being all arranged, in their proper places, in the same volume with the psalter, prayers, etc. In later times, the Breviary was divided into two parts, one for each half of the year, as was the case with those of Salisbury, York, and Hereford, used in England; and afterward into four parts, so as to be more portable, whence it was also called *Portiforium*. The Breviary is an entirely distinct book from the Missal (q.v.), the latter containing the proper offices for the service of the sacrifice of the mass.

The last settlement of the Breviary was under the pontificate of Pius V., and his bull of 1568 is that by which the present daily office of the Roman Church is authorized. This edition was compiled by the College of Sacred Rites at Rome, in conformity with the decrees of the Council of Trent, because of the variety of *Uses*, as they are called, which at that time existed in different dioceses. The bull of Pius V. abolished the use of all breviaries, except such as could prove a prescription of 200 years. This exception would have extended to the breviaries of Salisbury and York, if the Church of England had not already thrown off Rome's supremacy, and compiled a new Book of Common Prayer for herself. After this, 1602, Clement VIII. had a standard edition printed at the Vatican, to which all future editions were to conform; and again, 1631, Urban VIII. caused the metres of the hymns and the Latinity of the whole to be carefully revised. The Breviary is in Latin, portions of it being sometimes translated for the use of the unlearned. It is necessarily a very bulky volume, when complete; and although some legends of saints and martyrs may be of doubtful authenticity, yet it is a mine of interesting and devotional reading. Its general contents may be judged of from what has been already stated as to the sources from which they were drawn, every saint in the calendar having his proper services for the different canonical hours. The festivals of the Roman Church have their services, according to their importance, duplex, semi-duplex, or simplex—i.e., double, semi-double, or simple: these, again, are further distinguished, so that there are no less than 9 classes of serv-

ices—the Ferial or ordinary week-day, the simple, the day with an octave, the semi-double, the Dominical or Sunday, the double, greater double, double of the second class, double of the first class. Indeed, so elaborate and perplexing are the rubrical directions, that it is impossible to form any idea of them without consulting the Breviary itself, and there are probably many priests not thoroughly conversant with their own ritual.

The Breviary contains, besides an office for the dead, and other smaller offices, three kinds of office in honor of the blessed Virgin Mary—viz., (1) The full office, said on such festivals as the Purification, Annunciation, Immaculate Conception, Assumption, etc.; (2) The office of the Virgin Mary on Saturdays; (3) What is called the 'little office,' or the hours of the Virgin. This last was in use as early as the 7th c., and was enjoined by the Council of Claremont, 1096, to be said by the clergy daily, and by the laity on Saturdays, but the bull of Pius V. removed this obligation except as to clergy in choirs. The Roman Church enjoins, under pain of excommunication, all 'religious' persons—i.e., all persons, male or female, who have taken vows in any religious order—to repeat, either in public or private, the services of the canonical hours as contained in the breviary. For the influence of the old breviaries on the English Common Prayer-book (q.v.) consult Palmer's *Antiquities of the English Ritual*, and Maskell's *Monumenta Ritualia*. The matins or morning-prayer of the English Prayer-book is an abridgment, with many omissions and additions, of the matins, lauds, and prime of the Breviary, while the office of even-song, or evening-prayer, is in like manner an abridgment of the ancient vespers and compline.

BREVIER, n. *brē-vēr'* [F. *breviaire*, short—said to have been so named as having been the type in which *Breviaries* were printed]: a common printing-type: see TYPE. (This work is printed in brevier.)

BREVILINGUIA, n. plu. *brĕv'ĭ-lĭng' gwĭ-ă* [L. *brĕvis*, short; *lingua*, a tongue]: a division of the *Lacertilia*, comprising the *Geckos*, etc.

BREVIPED, a. *brĕv'ĭ-pĕd* [L. *brevis*, *short; pes*, genit. *pedis*, a foot]: having short 'feet,' meaning legs: N. a short-legged bird.

BREVIPENNATÆ, n. plu. *brĕv'ĭ-pĕn-nā'tē* [L. *brĕvis*, short; *pennātus*, furnished with feathers or wings—from *penna*, a wing]: group of natatorial birds including the penguins, auks, etc. BREVIPEN'NATE, a. *-pĕn'nāt*, short-winged.

BREVIPENNES, *brĕv-ĭ-pĕn'nēz*, in Ornithology: according to the system of Cuvier, that tribe of the order *Grallatores* (q.v.) in which the ostrich, cassowary, rhea, or nandou, emu, and apteryx are comprised, also the extinct dodo (see these titles). The Brevipennes are char-

acterized by shortness of wing, which incapacitates them for flight, but use their wings to aid them in running, which they do with great rapidity. Their *sternum* (breast-bone) has no ridge or keel. They constitute the family *Struthionidæ* of many ornithologists, and are by some placed among Gallinaceous (q.v.) Birds, to which they are allied by the form of their bill and their choice of food. They are, however, very different from all other birds, and whether ranked among Grallatores or Gallinaceous Birds, do not seem to form a natural part of the order. The gigantic *Dinornis* (q.v.) and other fossil birds of great interest exhibit the characters of the *Brevipennes.*

Gigantic birds, of which the footsteps appear imprinted on sandstones in the valley of the Connecticut and elsewhere, seem also to have belonged to this tribe. No remains or traces of such birds are, however, found nearly so ancient as many remains of quadrupeds. But to whatever geological period the commencement of their existence is to be referred, a peculiar interest is attached to them, because its close may be regarded as probably near. There is no tribe of birds that more generally shuns man, or disappears before the increase of population. The cassowary and the emu are rapidly becoming rare. The ostrich, the rhea, the apteryx, the notornis, etc., are found only in deserts or other deep solitudes.

BREVOORT′, *brĕ-vôrt′* JAMES RENWICK: American artist; b. Westchester County, N. Y., 1832, July 20. His art studies were made chiefly in Europe, where he spent several years sketching scenes in England, Holland, and Italy. In 1861 he was elected an associate of the National Academy, and in 1863 a full member. Since 1872 he has been its professor of perspective. His specialty as a painter is landscape work, and the following pictures of his are well known: *Lake of Como* (1878); *Storm on English Moor* (1882); *New England Scene; Morning in Early Winter* (1884); *The Wild November Comes at Last; Windy Day on a Moor* (1886).

BREW, v. *brô* [AS. *breówan;* Dut. *brouwen,* to brew; OF. *braux;* Gael. *braich;* W. *brag,* sprouted corn, malt; Icel. *brugga,* to brew: AS. *brug,* malt; Ger. *brauen,* to brew]: to make beer, ale, etc., by boiling and mixing the materials and fermenting them; to contrive; to plot. BREW′ING, imp.: N. the act of making beer from malt, etc. (see BEER); the quantity made at one time. BREWED, pp. *brôd.* BREW′ER, n. one who. BREWERY, n. *brô′er-ĭ,* the house containing the apparatus where brewing is carried on; also BREW-HOUSE. BREWAGE, n. *brô′āj,* a mixed drink.

BREWER, *brô′er,* DAVID JOSIAH: Amer. jurist; nephew of Justice David Dudley Field; b. 1837 in Smyrna, Asia Minor; admitted to bar in N. Y. city 1858; later removed to Kan.; judge of probate and crim.

courts of dist. of Leavenworth co., 1862–65; judge of dist. court 1865–69; county atty. 1869-70; judge of supreme court of Kan. 1870–80; judge of circuit court of U. S. 1884-89; became associate justice of U. S. supreme court 1889. In 1896 was appointed by President Cleveland a member of Venezuela Commission and chosen its chairman; he was a member of the British-Venezuelan Arbitration Tribunal, 1889, and President of the Universal Congress of Lawyers and Jurists, La. Purchase Exposition, St. Louis, 1904. Author of, *The Pew to the Pulpit* (1897); *The Twentieth Century from another View-Point* (1889); *American Citizenship* (1902).

BREWER, John Hyatt: American musician; b. Brooklyn, N. Y., 1856, Jan. 18. He studied piano, organ, and theory under local teachers, particularly Dudley Buck. He has filled the position of organist at the Church of the Messiah and the Clinton Avenue Congregational Church, Brooklyn, and since 1881 at the Lafayette Avenue Presbyterian Church in that borough, where he is also professor of vocal music at Adelphi College. His compositions include church music, vocal music, and works for the piano, organ, and orchestra. He has also written the cantatas *The Holy Night; The Birth of Love; Hesperus; Sea and the Moon; Herald of Spring; Twilight Pictures,* etc.

BREWER, Leigh Richmond: American Protestant Episcopal bishop; b. Berkshire, Vt., 1839, Jan. 20. He was ordained in 1867, and after serving as rector of Grace Church, Carthage, N. Y., 1866–72, and Trinity Church, Watertown, N. Y., 1872–80, was consecrated missionary bishop of Montana in the year last named.

BREWER, Thomas Mayo: American ornithologist; b. Boston, Mass. 1814, Nov. 21; d. 1880, Jan. 23. He was graduated at Harvard College in 1835, and was editor of the Boston *Atlas* in 1840. He edited Wilson's *Ornithology* and *Birds of North America,* and, in conjunction with Baird and Ridgeway, wrote *A History of North American Birds.*

BREWER, William Henry: scientist; b. Poughkeepsie, N. Y., 1828, Sept. 14. Graduated from Yale (now Sheffield) Scientific School, 1852, and subsequently studied at Heidelberg, Munich, and Paris. He was professor of Chemistry and Geology in Washington College, Pa., 1858–60; first assistant in geological survey of California, 1860–4; member of commission for the topographical survey of Conn. on cereal production in the United States (10th census); U. S. Forestry Com., 1896; scientific survey of the Philippine Islands, 1903. He is a member of many scientific societies. He has been Professor of Agriculture in the Sheffield Scientific School, Yale, since 1864. Author of *Botany in California,* etc.

BREWERTON *brô'er-tŭn,* Henry: American soldier; b. New York, 1801; d. Washington, D. C., 1879, April 17.

He was graduated with the class of 1819 at West Point. Commissioned second lieutenant in the corps of engineers, he first served as assistant in determining the 45th degree of north latitude at Rouse's Point, N. Y. He was assistant and professor of engineering at West Point (1819–21). Thereafter he was almost continuously engaged in such important engineering works as repairing the fortifications in New York harbor, construction of Fort Jackson, La., of Fort Adams, Newport, R. I., of the defenses of Charleston harbor, S. C., of the fortifications and improvements of Baltimore harbor (1861–4), and of Forts Monroe and Wool, for the defense of Hampton Roads, Va. He was brevetted brigadier-general in the United States army, 1865, March 13, for long, faithful, and meritorious services, and was retired from active service 1867, March 7, 'having been borne on the Army Register more than 45 years.' Dickinson College conferred the degree of LL.D. upon him 1847, July 8.

BREWING AND MALTING: Brewing is the process of making fermented drinks, such as ale, beer, cider, etc. See BEER.

Malting.—Malting is the preparing of cereals by germination or growth for the process of mashing. Barley is the grain commonly used for making malt for lager beer, ale, stout, vinegar and yeast-makers' or distillers' mash, etc., while wheat malt is used to a large extent in the production of weiss beer.

The barley is first cleaned in order to remove foreign seeds, straw, broken kernels, etc., by means of sieves and blower fans. As the character of the beer depends largely upon that of the malt, and as the latter's character can be determined during malting, it follows that there are various methods of details in malting. The following are the general manipulations employed:

Steeping.—The first requisite is moisture. This is given to the grain by placing it in steep tanks containing water of a certain temperature. Steep tanks are cylindrical iron vessels having conical bottoms so that all the grain will drop out when tank is emptied. They are generally placed on the top floor of the malthouse. The grain remains in the steep tank until it has absorbed the desired amount of water, the time differing for different kinds and quality of grain or the process of the maltster. For barley the duration of steeping is generally from 36 to 60 hours, averaging about 48 hours.

Growing or Germinating Floors.—The malt-house usually consists of several floors. The water in the steep tank is drained off and the wet barley dropped upon these floors below. The barley is now spread in heaps of about 12 to 14 inches high. The barley now dries out somewhat and begins to sprout or grow and small hair-like fibers, called rootlets, begin to show. As heat is

generated during growth, which is undesirable above a certain temperature, and as further proper growth requires pure air, it is necessary to aerate the growing barley (now called green-malt.) This is done by what is called 'turning the heap,' which consists of reshoveling the green malt in such a manner that the lower kernels of the old heap will be at the top in the new heap. This turning is repeated at regular intervals so that at the end of the growing period the heap covers the entire floor to a height of from five to six inches. This growth usually takes about five days, during which time water is sprinkled upon the heap whenever it becomes too dry.

Kilning or Drying.—After the green malt shows the desired degree of sprouting, it is necessary to quickly check further growth. This is done by drying it upon the kiln. The green malt is shoveled by means of a power shovel to one end of the floor where it drops through an opening into a bucket elevator and is conveyed to the kiln. The kiln usually has two floors placed one above the other made of strips of wire or perforated sheet metal and heated by means of an open fire from below. The green malt is spread evenly upon the upper kiln floor about 18 inches high, where it remains for 24 hours, during which time it is only partially dried. It is now dumped or dropped upon the lower floor. The malt on this lower kiln is again spread evenly and then subjected to a higher temperature until the desired degree of dryness is obtained, which usually takes from 20 to 24 hours.

Malt Cleaning.—The malt as it comes from the lower kiln is not yet suitable for brewing as it contains the rootlets and some kernels that were crushed or injured on the floors or during conveying. The malt now passes through cleaning machines consisting of sieves and blowers which remove the rootlets, dust and small and broken kernels.

Brewing Operations.—Modern breweries are usually divided into three departments, namely, the elevator or mill house where the materials are prepared and weighed; the brew house, where the wort is produced, and the cellars where the wort is fermented and treated to produce the finished beer.

Elevator or Mill House.—Here the malt is cleaned and stored. The desired amount of malt for the beer is weighed out in a scale hopper, and from thence passes through the malt mill where it is crushed so as to loosen the starch in the kernels. The crushed malt is then transferred to the storage hoppers in the brew house ready for use.

Brew House.—The brew house generally contains the following vessels: hot and cold water tanks; malt and cereal (rice or corn) hoppers; the cereal cooker, mash tub, kettle, and hop jack and cooler.

Mashing in Cereal Cookers.—Cookers are of two kinds; open ones, or, as they are usually called, rice

tubs, and closed or pressure cookers. In these vessels rice or corn (grits or meal) is boiled for a certain length of time in order to loosen up or soften the hard flinty condition of their starch so as to render it able to be more completely dissolved or acted upon in the mash tub. Crushed malt to the amount of about one quarter the weight of corn goods is added in the open cookers. The mashing method in the open cooker varies somewhat among different brewers, the following being about the average method: The materials are mixed with water so as to have a temperature of 30° R. (100° F.). The mash is held at this temperature for about 15 minutes then run up to 56° R. (158° F.), and held for 30 minutes, then heated quickly to boiling and boiled from 45–75 minutes for corn goods depending on the fineness of the material, and 30 minutes for rice. The cereal mash is then run down to the mash tub where the mash is finished.

Mashing in Mash Tubs.—The mash tub, like the open cooker, has a stirrer, and a heating coil, but is further supplied with a strainer or perforated false bottom for clarifying the wort, and a sprinkling device or sparger for washing out the grains. In the mash tub the mash is started and, when the mash from the cooker has been added, the combined mash is finished.

The method of mashing for the production of a beer of average character is approximately as follows: The crushed malt and water are mixed so as to have a temperature of 30° R. (100° F.) and the mash allowed to rest at this temperature for one hour. The temperature of the mash is now raised to 54° R. (153° F.) to 55° R. (156° F.), in about 15 to 20 minutes, by running in the boiling corn or rice mash from the cooker (with the addition of steam should same be necessary). This temperature is held for 10 to 15 minutes, during which time the stirrer is operated continuously.

The mash is now heated with steam and hot water, in 15 to 20 minutes, to 59° R. (165° F.) and the stirrer stopped. The mash is now allowed to rest from 30 minutes to one hour in order to allow the hulls of the malt to settle so as to act as a filtering material for the wort, after which the wort is run into the kettle. After the wort has run off, the solid substances remaining in the mash tub, called grains, are washed out or sparged with water in order to recover as much of the wort contained in them as possible. The grains are then thrown out of the mash tub and sold as cattle feed.

Boiling the Wort in Kettle.—The kettle consists of a pear-shaped copper vessel having a double or jacketed bottom for heating the wort, and a vent pipe to roof for conducting off the vapors generated during boiling. The steam outlet of the coil or jacketed bottom is connected to a steam trap which automatically discharges the water condensed in the coil or jacket without materially reducing the pressure of the steam. The wort

as soon as it runs clear from the mash tub is collected in the kettle. Steam is turned on in the kettle as soon as the jacketed bottom is covered with wort. This wort, and that continuously running in, is then heated to and kept at about 70° R. (190° F.) in order to destroy the action of the diastase and prevent further saccharification in the wort taking place. When the kettle is full or nearly so, steam is further turned on and the wort brought to boiling and boiled for one hour when it should show a good 'break.' During this boiling the undesirable albuminoids are precipitated in finely divided form, rendering the wort turbid. Upon continued heating these albuminoids unite or lump together and leave the wort between these lumps clear and transparent. This clarification is called the 'breaking' of the wort.

Hops are now added, usually about two fifths of the total amount used, after which addition the wort again becomes turbid due to the further precipitation of albuminoids by the tannic acid contained in the hops. After about 40 minutes further boiling the wort should again clarify or show its second break when another two fifths of the hops are added and the wort boiled about 20 minutes. The remaining one fifth of the hops are added and the wort run out of kettle into hop jack immediately.

Wort in Hop Jack.—The hop jack consists of a round or square iron tank, having a perforated false bottom or strainer and a sparger or sprinkler similar to that of the mash tub. The wort, with the hops, is run into the hop jack and allowed to rest until the hops have settled so as to form a filtering material for the clarification of the wort. As soon as this takes place the wort is pumped to the surface cooler or beer tank located at the top of the cellars. After the wort has all been removed the hops are washed out or sparged with hot water in order to recover as much of the absorbed wort as possible.

Surface Cooler and Beer Tank.—The surface cooler consists of a shallow iron pan of a length and width very large in proportion to its depth so as to give the wort as much surface as possible. Hereby the wort is cooled quite rapidly and aerated.

The beer tank, an iron cylindrical vessel closed at the top, is rapidly supplanting this cooler, since the latter, by the large surface it presents, endangers the wort to infections by impurities or germs always more or less present in the air. As soon as the wort on the surface cooler or in the beer tank cools to about 50° R. (145° F.) the danger of its infection by impurities, bacteria, etc., begins. From this stage until the beer is finally marketed, months later, it requires the daily, almost hourly vigilance of the brewer to keep it pure and free from contamination.

Baudelot Cooler.—This consists of a series of pipes

or tubes arranged in vertical tiers, over the outside of which the wort flows, while through them the cooling medium is circulated. It is usually made in two sections, the upper being of copper tubes, containing cold water, and the lower of steel containing ammonia.

The Cellars.—The wort after cooling enters the cellars, where it is fermented, stored, kraeusened, bunged, fined, filtered, and racked ready for the market.

Fermentation of Wort.—The wort as it comes from the cooler is run into fermenting tubs in which the yeast has previously been placed. Sometimes the yeast is added after the tubs are filled with wort. The yeast, from one to one and a half pounds to the barrel of wort, is usually given, not in its natural state, but first mixed with an equal quantity of wort and thoroughly aerated.

The fermentation now begins. Within 15 to 24 hours white bubbles appear on the surface around the sides of the tub. The wort at this time is covered with a head of thick, lumpy consistency composed largely of albuminoid matter. The whole surface now soon becomes covered with a fine white froth, which soon changes to a frizzled appearance called 'kraeusen stage. The froth head then moves toward the centre, the fermentation becomes more active, the froth head rises higher and becomes darker and the fermentation now passes into the 'high kraeusen' stage, generally after about 70 to 80 hours. This stage is maintained for about 48 to 72 hours when the head begins to collapse and deepens in color to the end of the fermentation. The temperature is then gradually reduced by means of cooling attemperators to 3° R. (39° F.) in the next 3 or 4 days. Total duration of fermentation, 10 to 11 days.

Storage of Beer.—After the wort is fermented the beer is filled into storage vats (closed at the top) where it is stored at a temperature near the freezing point for about two or three months. During this storage period there is a slight progress of secondary or after fermentation and the yeast settles, and, what is most important in bottle beer that is to be pasteurized, there is a further precipitation of albuminoids.

Chip Cask Treatment.—When sufficiently matured in storage the beer is run or pumped into the chip casks, so called because in them wooden chips are placed to retain the sediment produced by the finings. In the chip cask, two properties must be imparted to the beer that it did not possess during storage, namely, life or proper amount of carbonic acid gas contents, and brilliancy. Life is given the beer by addition of 8 to 10 per cent. of kraeusen, (that is, young beer in the first, or kraeusen stage of fermentation). This when added to the old 'flat' storage beer continues to ferment, and, as the casks are closed the gas generated gives life to the whole amount of beer contained.

For bottle beer, kraeusen made from grape sugar is used, as grape sugar contains no albuminoids as does the kraeusen from regular fermenting worts.

Brilliancy is given to the beer by removing the yeast and other particles in suspension by means of finings made from isinglass. After bunging the cask, a certain pressure only (4½–5 pounds) is desired and any excess pressure generated above this is automatically removed by an automatic blow-off device called the bunging apparatus.

Filtration of Beer.—Although beers will generally become clear in the chip cask if they are left there long enough, they are now almost universally filtered after they have become moderately fine (clear) in the chip cask. Thereby much time is saved, also a large part of the finings and chips. Furthermore, filtration furnishes a more brilliant beer than can generally be obtained by chip cask treatment only. Modern beer filters differ considerably in construction, but are all alike in that they contain several or many compartments or cells filled with filter mass or pulp (a substance similar to blotting paper) through which the beer is forced. The filter mass or pulp can be used again and again, being washed after each use to remove the beer and sediments it collects during filtration. The operation of filtration is as follows: The bunging apparatus is disconnected and air pressure (15 to 20 pounds) is put on the chip cask and the beer thereby forced through the filter.

Carbonating.—Beer is often carbonated. This is the mechanical forcing of carbonic acid gas into the beer by which time, labor, space, and cost of chip casks are saved, besides obtaining a more durable beer.

BREWSTER, *brô'stėr*, Benjamin Harris, American lawyer: b. Salem County, N. J., 1816, Oct. 31; d. Philadelphia, 1888, April 4. He graduated at Princeton in 1834, was admitted to the Philadelphia bar (1838), and for nearly half a century practiced with ardor and success the profession he loved. In 1846 he was one of a commission to adjudicate the claims of the Cherokee Indians against the United States; in 1867 he became attorney-general of Pennsylvania, and in December 1881 President Arthur made him attorney-general of the United States. Shortly after the death of President Garfield, Attorney-General Wayne MacVeagh retained Brewster to assist in the prosecution of the 'Star Route' conspirators. He was an impressive orator, and possessed scholarly attainments of a high order.

BREWSTER, Chauncey Bunce, American bishop: b. Windham, Conn., 1848, Sept. 5. He is a direct descendant of Elder Brewster of Plymouth Colony fame. He graduated at Yale in 1868, Berkeley Divinity School, 1872, and was ordained priest, 1873. He was rector of Christ Church, Rye, N. Y., 1873–81; Christ Church,

Detroit, 1881–5; Grace Church, Baltimore, 1885–8; Grace Church, Brooklyn, N. Y., 1888–97. On 1907, June 8, he was elected coadjutor-bishop of Connecticut, and consecrated in New Haven, 1907, Oct. 28. Upon the death of Bishop Williams, in 1899, Bishop Brewster became diocesan of Connecticut. Beside sermons and pastoral charges, he has written *The Key of Life*, (1885); *Good Friday Addresses* (1894); *Aspects of Revelation* (1901), being the Baldwin lectures before the University of Michigan; *The Catholic Idea of the Church* (1905).

BREWSTER, Sir David: 1781, Dec. 11–1868, Feb.; b. Jedburgh, Scot.: natural philosopher and writer. He was educated for the Church of Scotland at the Univ. of Edinburgh, where he distinguished himself. In 1808, he undertook the editorship of the *Edinburgh Encyclopædia*, to which he contributed many important scientific articles. Previous to this, he had entered deeply on the study of optics, with which his name is now enduringly associated. The philosophical toy, called the kaleidoscope, was invented by him in 1816. In 1819, in conjunction with Prof. Jameson, he established the *Edinburgh Philosophical Journal;* and in 1831 he was one of the chief originators of the *British Assoc. for the Advancement of Science.* The honors conferred on this distinguished man make up a long catalogue. In 1815, he obtained the Copley medal of the Royal Soc. for one of his optical discoveries, and soon afterward was elected a Fellow; in 1816, he received half the physical prize bestowed by the French Institute for two of the most important scientific discoveries made in Europe during the two preceding years; in 1819, the Royal Soc. awarded him the Rumford gold and silver medals, for his discoveries on the polarization of light; in 1825, he became corresponding member of the Institute of France; in 1832, he was knighted, and had a pension conferred upon him; in 1838 he was chosen principal of the united colleges of St. Leonard and St. Salvador, St. Andrews; in 1849, on the death of Berzelius, in the preceding year, he was elected one of the eight Foreign Associates of the French Institute, the highest scientific distinction in Europe. Sir David was also a member of the Imperial and Royal Academies of St. Petersburg, Berlin, Copenhagen, and Stockholm; presided over the British Assoc., and in 1851, over the Peace Congress held in London. In 1859, on the death of Dr. John Lee, he was chosen principal of the Edinburgh Univ. His principal work is his *Life of Newton*, first published in 1828, in the Family Library, issued in a new and greatly enlarged form in 1855. Among his works are his interesting *Letters on Natural Magic*, addressed to Sir Walter Scott, published also in the Family Library; *More Worlds than One* (1854); his

treatises on the Kaleidoscope and on Optics (Cabinet Cyclopædia); his *Martyrs of Science;* and his treatises in the *Encyclopædia Britannica* on Electricity, Magnetism, Optics, the Stereoscope, etc. Among periodicals to which he contributed largely are the *Edinburgh* and *North British Reviews.* See *Home Life of Brewster* by his daughter, Mrs. Gordon (1869).

BREWSTER, Frederick Carroll, American lawyer: b. Philadelphia, Pa., 1825, May 15; d. Charlotte, N. C., 1898, Dec. 30. He graduated at the University of Pennsylvania, read law with his father, and was admitted to the Philadelphia bar, 1844, of which he became a leader and one of its brightest ornaments. He was elected city solicitor (1862); judge of the court of common pleas (1866–9); attorney-general of the state (1869–70). He was successful as counsel in the famous Stephen Girard will case, and secured the decision in the Chestnut Street bridge case, wherein a decree was entered in the United States supreme court allowing the city of Philadelphia to cross the Schuylkill River by bridge. He published *Reports of Equity, Election, and other Cases in the Courts of the County of Philadelphia* (1869); *Digest of Pennsylvania Supreme Court Cases* (1869); *Brewster's Blackstone, with Annotations of Decisions on the Rule in Shelly's Case* (1887); *A Treatise on Practice in the Pennsylvania Courts* (1887–8).

BREWSTER, William: 1560–1644; b. England; son of William Brewster of Scrooby, Eng. (some say son of Henry or James Brewster, vicar of Sutton-cum-Lound). He studied for a time at Cambridge Univ., accompanied William Davison, ambassador to the Netherlands and continued in his service two years. He became an earnest Christian following the Puritan teachings of the Rev. Thomas Hooker; and when he and his fellow 'separatists' had become objects of persecution, he emigrated with other Puritans to Holland and thence to Plymouth, Mass., 1620. He was an elder in the church at Plymouth, and is generally known as 'Elder Brewster.'

BREWSTERITE, n. *brôs'tėr-īt* [after Sir David *Brewster*]: a mineral, a silicate of lime and alumina, occurring in short prismatic crystals of a grayish-white or yellowish color, and vitreous lustre. Brews'toline, n. *-tōlėn,* a transparent colorless fluid occurring in minute cavities of rock-crystals, etc., said to be liquid carbonic acid.

BREZOWA, *brā-zō'vâ:* market town of Hungary, county of Neutra, on a river of the same name, 20 m. n.w. of Leopoldstadt. Pop. 6,000.

BRIAN BOROIMHE, *brī'an bo-roym',* or Brian Boru, *bo-rô',* King of Ireland: d. 1014: ascended the throne of both Munsters—answering to the present counties of Tipperary and Clare—978. Some time aft-

erward, he deposed O'Maelachaghlin, and became supreme ruler of Ireland. The surname, Boroimhe, signifying tax, was given him in consequence of the tribute in kind levied from the various provinces. King Brian supported a rude but princely state at his chief castle at Kincora, in the neighborhood of the modern town of Killaloe; he had seats also at Tara and Cashel. The vigor of his reign brought prosperity to his country. He defeated the Danes in upward of 20 pitched battles, restricting their influence to the four cities of Dublin, Wexford, Waterford, and Limerick. In the battle of Clontarf (1014), in which he was killed, he gained a signal victory over a united army of revolted natives and Danes, the power of the latter receiving a shock from which it never recovered.

BRIANÇON, *brē-ōng-sŏng'* (ancient *Brigantium*): town of the dept. of the Hantès-Alpes, France, on the right bank of the Durance, about 35 m. n.e. of Gap. It is the highest town in the French empire, nearly 4,300 ft. above sea-level. As the principal arsenal and depot of the French Alps, Briançon is very strongly fortified, while several forts guard the approaches, and every height in the vicinity is a point of defense. It is considered impregnable. Troops can readily be marched from it to the passes of the Simplon, St. Bernard, Mont Cenis, and the Col de Tende. Mont Genèvre affords a practicable passage into Italy from the town itself. Briançon has some manufactures of cotton-goods, hosiery, cutlery, crayons, etc. Pop. 7,200.

BRIANSK, *brē-ănsk'*: town of Russia, govt. of Orel, 70 m. w. of the city of Orel. It is on the right bank of the Desna, surrounded with earthen ramparts, and has considerable trade in grain, hemp, wax, linen, cables, cordage, iron, etc., with Kherson, Odessa, and other ports on the Black Sea. Briansk has a cannon-foundry and 13 churches. Pop. 2,400.

BRIAR; see BRIER.

BRIARE, *brē-âr'*: town in the dept. of Loiret, France; on the right bank of the Loire, at the point where the Canal de Briare enters that river, about 43 m. s.e. of Orleans. The canal, which unites the Loire and the Seine, was the first constructed in France, having been begun by Sully, and finished 1642. Briare has considerable trade in wine, wood, and charcoal. It is supposed to occupy the site of the ancient *Brivodurum*. Pop. 5,000.

BRIAREAN, a. *brī-ā're-an*: pertaining to the fabled Briareus, who had a hundred hands and fifty heads; hundred-handed.

BRIAREUS, *brī-ā re-ŭs* or ÆGÆON: a mythological giant, one of the three sons of Uranus and Gaia (Heaven and Earth), his brother giants being Cottus and Gyges. He had a hundred arms, and fifty heads. He was hurled

into the sea by Neptune, and enchained under Etna by Jupiter, as a punishment for his revolt. It is difficult, from the contradictory accounts concerning the Hekatoncheires (hundred-handed giants) to determine exactly what forces of nature were symbolized by them. The hundred arms may represent the waves of the sea, and such terrible natural forces as earthquakes, etc.

BRIBE, n. *brīb* [F. *bribe*, a piece of bread: W. *briwo*, to break; *briw*, broken: It. *birbante*, a cheat: Gael. *brìb*, a small sum of money]: a sop, or gift to stop the mouth of one, or to obtain an undue compliance; a price or reward given to induce any one to do a criminal or immoral act; a gift for the purpose of obtaining compliance—unless in familiar language, never used in a good sense: V. to give or promise a reward with the view of perverting the judgment or conduct of another; to hire for a bad purpose. BRI'BING, imp. BRIBED, pp. *brībd*. BRI'BER, n. one who. BRIBERY, n. *brī'ber-ĭ*, the practice of giving or taking bribes. BRIBE'LESS, a. that cannot be bribed; without a bribe to offer; free from bribes. BRI'BABLE, a. *-bă-bl*, capable of being bribed.

BRIB'ERY: giving, offering, or taking—also soliciting or receiving—a price in any way relating to the administration of justice, or influencing behavior in a matter of official or civil duty, leading to any act against the common rules of integrity.

Election Bribery.—A well-known form of corruption, is the canker and disgrace of constitutional government. Individuals, with little to recommend them but wealth, and it may be some local distinction, wishing to be elected representatives in the legislature, do not scruple, through various devices, to buy the votes of the meaner order of electors by bribes. Bribery at elections is practiced with more or less openness and audacity, in various parts of England and the United States; nor are base influences of this kind unknown in connection with the more meagre constitutional forms of some states of continental Europe. England has had the unenviable notoriety of being the country in which bribery was reduced to a regular, though covert, system. It was demonstrated by parliamentary inquiry, that masses of the population in certain towns—more particularly the class called freemen—look upon the franchise as a privilege which, for personal benefit, entitles them to exact so much money for their votes. Public considerations had no weight with them whatever. It seemed to them alike their duty and their interest to sell their votes to the highest bidder. The Earl of Dundonald mentions in his *Autobiography*, that when, as Lord Cochrane, he offered himself as a candidate for Honiton, he was barefacedly told by one of the electors, 'that he always voted for Mister Most;' and not choosing to bribe, the earl lost his election. The amount of bribe

ordinarily paid at elections in this venal class of boroughs, varied from £1 to £10, according to circumstances; as high a sum as £20, and even £50, had been known to be given in the extremities of a contest. For these disgraceful practices, the law provided certain penalties; but to avoid these, and for the sake of decent appearance, the candidates employed a mean class of agents, or were in some obscure way assisted by confederates, of whose proceedings it was difficult to substantiate any guilty knowledge on the candidate's part. The agents more immediately concerned did the business of bribing in private, sometimes in darkened apartments, where no one could be seen. Formerly, the treating of voters in taverns was added to other varieties of corruption, and the demoralization that ensued on occasions of this kind amounted almost to a saturnalia. The law having interposed to check this gross form of bribery, the evil has latterly subsided into a common-place routine of secret money-dealings. Of course, by this illegal expenditure, with the necessary outlays which the law allows, the cost of an election was in many cases enormous. Few seats of English borough members cost less than £1,800; but double and triple this sum was a common outlay. It is well-known, that for certain boroughs any man—no matter what be his political opinions or private character—might be returned by advancing £4,000, and asking no questions as to what was done with it. As the bribery was on both sides, it may be safely averred that the money spent at some contested elections amounted to £10,000. As regards elections for counties, the influences brought to bear are ordinarily of a different kind, still morally wrong. The Scotch have some reason to boast that their country is comparatively exempt from this social disorder. To avert every form of corrupt influence, the Ballot (q.v.) was long vehemently urged, and an act to secure the use of the ballot in parliamentary and municipal elections throughout Great Britain and Ireland was finally passed 1872, July. So far bribery seems to have been almost unaffected by the Ballot Act. The improved mode of trying election petitions by judges has worked well. A new Corrupt Practices Act was passed 1879, and a still more stringent bill 1883. Severe sentences of imprisonment were passed on several persons of good standing, found guilty of bribery 1880–1; and several cities were deprived of electoral privileges in 1882 for corruptness. See CORRUPT PRACTICES ACT: PARLIAMENT: MUNICIPALITY.

In the United States, the laws impose severe penalties on bribery of voters; yet in a few large cities, and in some portions of the country, bribery of voters at state and federal elections is shamelessly carried on, and is recognized as one of the most dangerous evils in the body politic. It is not understood, however, to have yet become characteristic of elective processes as a

whole, though there are indications of its rapid increase. In some states, the Australian mode of balloting is being advocated as a safeguard. Unless the spread of the evil can be checked, it evidently imperils the very existence of republican government.

Bribery of Legislators.—As the character of legislators must be somewhat influenced by the character of the men whom they represent, and by the methods to which they owe their official station, some legislative actions in some of the states have not escaped suspicion. Meanwhile—a hopeful sign—the public sensitiveness and watchfulness on this point has increased.

Bribery of Custom-House and Excise Officers.—It is not known to what extent this exists. The U. S. Customs laws offer great temptations in their administration; but the laws also provide strict safeguards. Though some corruption exists, it is not thought to be prevalent. It is judged that the average of official honesty in this department is slowly rising.

Bribery of Judges.—Individual cases of corruption on the judicial bench cannot be denied; but the public conscience is not debauched on this question as it seems to have become on that of bribery at elections; and the high purity of English and American judges may, in general, be assumed.

BRIBERY-OATH: an oath which a voter at a parliamentary election is obliged to take, if the polling sheriff sees fit to administer it, wherein he certifies that he has received no bribe for his vote.

BRIBIESCA, *bre-ve-ĕs'kâ:* town in Spain, 20 m. n.e. of the city of Burgos. Pop. 3,310.

BRIBIR, *bre-bēr':* town of Croatia, in Austro-Hungary, near the sea, 18 m. s.e. of the city of Fiume. Pop. 4,150.

BRIC-A-BRAC, n. *brĭk-ă-brăk* [F.—a word formed from the imitation of *de bric et de broc—familiarly,* on this side and on that]: old curiosity objects; articles of vertu; old and second-hand objects; costly old furniture.

BRICHERASIO, *bre-kā-râ'se-ō:* town of Italy, in the province of Turin, adjacent to Pinerolo, at the foot of the Alps. Pop. 3,502.

BRICHETEAU, *brēsh-tō,* Isidore: 1789–1861; b. in the dept. of Aude: French medical writer; pupil and assistant of Pinel, the distinguished physician. His contributions to the *Dictionary of Medical Sciences* were of an important character. He published several works which were widely read, and generally accepted as authorities by medical students.

BRICE, Arthur John Montefiore: English barrister and traveler; b. 1859, June 27. He founded and for some time edited the *Educational Review,* and has traveled extensively in Europe, Asia, the Arctic regions, and North and South America. He has published *Stanley*

the African Explorer (1888); *Florida and the English* (1888); *David Livingstone* (1889); *Leaders into Unknown Lands* (1891); *Geographical Methods* (1895); *The Great Frozen Land* (edited 1895).

BRICE, CALVIN STEWART: American capitalist; b. Denmark, Ohio, 1845, Sept. 17; d. New York, 1898, Dec. 15. He practiced law in Cincinnati from 1866 to 1880, when he became interested in railroad and various other financial undertakings. He was presidential elector on the Tilden ticket in 1876 and the Cleveland ticket in 1884 and chairman of the Democratic National Committee in 1888. In 1890 he was elected United States Senator from Ohio, and served on the Appropriations, Pensions, Pacific Railroad, and Public Buildings and Grounds committees. Shortly before his death he formed a syndicate which secured vast railroad and mining concessions in China.

BRICK, n. *brĭck* [F. *brique*, a fragment or lump, a brick; AS. *brice*, a fragment: old Dut. *brick*, a bit, a fragment: It. *briccia*, a collop or slice]: a shaped mass of clay burned hard in a kiln, and used for building purposes; a small loaf of bread: V. to lay or pave with bricks; to imitate brickwork on plastered walls. BRICK'Y, a. *-ĭ*, full of or formed of bricks. BRICKBAT, n. [*brick*, and *bat*, in sense of a rough lump]: a rough piece of a brick. BRICK-KILN, n. *-kĭl*, a furnace in which bricks are hardened by fire. BRICK'LAYER, n. *-lā-ĕr*, a man who builds with bricks. BRICK-CLAY, the clay used in the manufacture of bricks, tiles, etc.; in *geol.*, used in contradistinction to *bowlder-clay;* and denoting the finely laminated clays which overlie the true bowlder-clay. BRICK'MAKER, n. one who makes bricks. BRICK'MAKING, n. the business of making bricks. BRICK'NOGGING, n. *-nŏg-gĭng*, brickwork built up between timber framing. BRICK'TRI-MMER, a brick arch abutting against a wooden trimmer in front of a fireplace, to guard against accidents by fire. BRICK'-TROWEL, a trowel used by bricklayers.

BRICK, n. *brĭk* [Gael. *brigh*, vigor, pith]: in *familiar slang*, one to be depended upon; a good, solid fellow.

BRICK, *brĭk:* a mass of clay, shaped and hardened for use in building. The earliest examples of this branch of the ceramic art were doubtless the sun-dried bricks of Egypt, Assyria, and Babylonia. Many of these, which, in a northern climate, the frosts of a single winter would destroy, have been preserved for some 3,000 years by the dry, warm atmosphere of those countries. Sun-baked bricks of ancient date are found also in the mud wall of old towns in India. Kiln-baked bricks must have been the products of a later time; but they are found in all the chief ruins of ancient Babylonia, where they were often used to face or bind together wall of sun-dried bricks, and occasionally

they were even ornamented with enamelled colors. Burned bricks were employed in the foundations of the Tower of Babel (Gen. xi. 3). These ancient bricks, baked whether by the sun or by fire, all were made of clay mixed with grass or straw. The ancient Greeks, probably owing to their possessing plenty of stone, cared little for building with burned clay; but most of the great ruins of Rome are built of brick, and the Romans appear to have introduced the art into England. Interesting historical information has been obtained from the impressions on Roman, and especially on Babylonian bricks. In many instances, the Roman bricks found in England have been removed from their original position, and employed in the construction of buildings of later date. The earliest instance in which bricks of the modern or Flemish make occur in England, is Little Wenham Hall, Suffolk, 1260.

Manufacture.—Clay suitable for the manufacture of common bricks is abundant, but there is great difference in the nature and quality of the clays in various localities. The basis of clay consists of hydrated silicate of alumina, with a varying proportion of other mineral matters, chiefly free silica (sand), iron, lime, magnesia, and potash. Great advantage is derived from digging clay in autumn, and exposing it all winter to the disintegrating action of frost. This is not always attended to, but when neglected, the bricks made from it are apt to be unsound and faulty in shape. The next process is that of tempering or mixing the clay into a homogeneous paste, sometimes by the spade, more commonly in the pug-mill (see POTTERY—*Manufacture*) or by crushing between a pair of rollers; often, indeed, both are employed. In making bricks by the old hand process, the shape is given by a mold either entirely of wood, or of wood faced with metal, and without top or bottom. This admits of the clay being pressed into it by a tool called a plane, which is also used to produce an even surface on the upper and lower beds of the brick, by working off the superfluous clay. Sand is used to part the wet clay from the mold and the table on which it rests.

Although hand-made bricks are still very common, yet machinery is now always employed when large quantities are required. Brick-making machines are of two leading kinds; one class of them being constructed to work the clay in a wet plastic state, the other class requiring it to be in a semi-dry condition. Of the two sorts, the wet-clay machines are the simpler, cheaper, and can be worked by less skilled workmen. On the other hand, the dry-clay machines, which make the bricks by forcing the clay into molds by strong pressure, shorten the process, as no time is required for drying them. The bricks so made, too, are not only of a more perfect shape, but they can be molded into any

form, and may even be made highly ornamental at a very slight additional cost.

The fresh bricks, after being carefully dried, either in the sun or by artificial heat, are usually baked in a kiln with a suitable arrangement of fires and flues. Kilns are of many forms, and the time required for firing in them varies from 40 to 60 hours for common red and white bricks, while for some fire-bricks 150 hours are necessary. Where kilns are not used, bricks are burned in clamps, the clay requiring to be mixed up, in the process of tempering, with a quantity of ground coal sufficient to burn them. A good test of the character of a clay is obtained by the result of firing. The average contraction in the kiln for prepared clays is 7½ per cent. If a brick contracts much more than this, the clay is too fusible; if less, then it is likely to be of an open porous body, which retains its shape well during the firing process.

All brick clays contain iron, and the color of a burned brick almost entirely depends on the amount of it which is present; thus clays containing less than 1 or 1½ per cent. of iron, change in the kiln to various shades of cream color and buff, while those containing more than 2 per cent., range in color from yellowish-fawn to dark red. Blue bricks are made from the same clay as the red by controlling in a peculiar way the supply of air in firing, and by carrying the heat slightly further. It is asserted by some that the red is changed to the black oxide of iron in the process.

Fire-bricks are made from clay as free as possible from oxide of iron and alkaline substances, so that there may be no tendency to fuse in the kiln, however high the heat. Fire-clays are abundant in the coal-measures; a celebrated clay is that of Stourbridge, which is exported to all parts of the world. See FIRE-CLAY.

Much attention has been given recently to the manufacture of fine bricks and terra cotta, which is only another name for ornamental bricks of various shapes, or architectural enrichments of the same material. The effect of some of the public buildings recently erected in London and elsewhere, in which terra cotta has been used, is beautiful. Although it cannot be said to equal sandstone in appearance, it has yet the advantage of giving a much greater variety of color, and is incomparably better and more enduring than a facing of stucco or cement.

The size of bricks, in England, is commonly 9 in. by 4½ in. by 2½ in.; in the United States, somewhat less; 7¾ (or 8⅓) in. by 4 (or 4½) in. by 2 (or 2¼) in.

BRICK'LAYING—BRICK'WORK: mode of placing bricks together to form a wall: the construction so made. The materials of which a town is built depends mainly on the materials furnished by the surrounding

district. In a mountainous country like Scotland, cities of stone, such as Edinburgh, Glasgow, and Aberdeen, naturally abound; while London, and most of the great towns of England, situated in alluvial valleys and plains, are built of bricks from the alluvial clay beneath and around them. In Holland, where the whole country is but the delta of the Rhine, and no stone is to be found, brick is universal, even to the paving of the streets.

The standard size of English bricks being 9 in. by 4½, the thickness of walls is regulated thereby. American bricks being of nearly the same size, involve nearly the same constructive rules. Walls are either half-brick, 1 brick, 1½, 2, 3, or 4 bricks in thickness. In moderate-sized modern English houses, the inside partition-walls are usually half-brick, the outer walls, 1 or 1½. In larger houses of superior construction, a thickness of two or three bricks is sometimes used. This latter thickness is seldom exceeded, except in large public works. Modern brick houses in England are, for the most part, far less substantial than those erected in former times. English building leases being usually granted for 99 years, at the expiration of which term the whole property reverts to the freeholder, the object of the builder is merely to make a house that shall stand for that period, and not to expend any money for the sake of further stability. In the United States building leases are not so common; but other causes have tended to make much of our building less substantial than that of our English forefathers. Recently however, the style of our best buildings has become much more solid. Garden-walls are commonly built but half-brick in thickness; these, however, are strengthened by 9-in. piers at intervals of 10 or 12 ft. In laying the foundations of walls, the first courses should be thicker than the intended superstructure, and the projections thus formed, usually of quarter brick on each side, are called 'set-offs.' Before laying walls of houses, trenches are dug, and the foundation tried with a crowbar or hammer. If it is found loose, and the looseness due to superficial soil, this is removed, and its place supplied with fragments of stone and old broken bricks, closely rammed together. In some cases, inverted arches of brick are built for foundation, or a stratum of concrete laid down: see CONCRETE.

Mortar composed of lime and sand is the common cement for brick work. It should be equally and carefully applied; and the bricks wetted, in order that the mortar may adhere more firmly, by being absorbed into their pores. The force with which good mortar is capable of adhering to bricks is very remarkable. It is found to be greatest in old structures that have been exposed to the continuous action of water. Such B. is said to be 'water-bound' by workmen, and can scarcely be separated without breaking the bricks.

BRICKLAYING.

A fundamental principle to be rigidly observed in laying all kinds of brick is, that *no two contiguous perpendicular joints shall fall immediately below each other,* or to use the bricklayer's phrase, the work must 'break bond.' The mode of arrangement of the bricks to effect this is called the *bond;* a layer or stratum of bricks is called *a course.* Bricks laid with their lengths in the direction of the course, and their sides to the wall face, are called *stretchers;* those laid across the line of the course, with their ends forming the wall-face, *headers;* a layer of headers, a *heading course;* of stretchers, a *stretching course.*

The two kinds of bond chiefly used are the English and Flemish bond. English bond consists of alternate stretching and heading courses; Flemish bond, of a stretcher and header laid alternately in each course. English bond is the strongest; Flemish bond the more ornamental: and they are used accordingly. There are two other kinds of bond occasionally used—*herring* bond, and *garden-wall* bond. The former is applied to form the core of thick walls, where Flemish bond is used for the facing. A course of bricks is laid obliquely at an angle of 45° to the face of the wall; then above it, another course at the same angle, but inclined in the opposite direction, so that the joints may cross the first. This is considered to add to the strength of Flemish bond, but is objectionable on account of the triangular interstices necessarily left between the oblique bricks and the bricks of the facing. Garden-wall bond is used only for 9-inch walls, and formed by laying three stretchers and one header, and so on in each course. In order to strengthen Flemish bond, bands of hoop-iron are sometimes laid flatwise between the courses. This 'hoop-iron bond' has superseded the old practice of using bond-timbers, which were inserted the whole length of the wall. The hoop iron should be slightly rusted, to secure the complete adhesion of the mortar.

In constructing arches of brickwork, much care and skill are required. A wooden centring is always used; and when very rude work only is required, common bricks are laid upon the centring, and the gaping interstices at the upper ends filled with rough brick wedges. For better work, each brick has to be properly bevelled, according to the curve. When semicircular arches are made, all the bricks require an equal bevel, and therefore bricks molded uniformly to the required angle may be used; but for other curves and for flat arches, each brick has to be separately shaped by the bricklayer. In order to do this, a drawing of the required arch is made of the full size on a board; on this the bricks are laid side by side, and shaped to the lines of the drawing; they are then transferred to their corresponding place in the structure. The bricks are first rudely shaped by the *brick-ax,* then

finished on the *rubbing-stone*, a piece of rough grained stone about 20 inches in diameter. In all kinds of brick, the walls should be built up level throughout, in order that the *settlement* may be equal. An unequal settlement may produce a rupture of the wall.

Brick is measured by the rod or by thousand. The bricklayer is always attended by a laborer or hodman, who carries his bricks and mortar in a 'hod'—a triangular wooden box, open at the top and one end, and supported on a round leg, by which the hodman holds it on his shoulder. A bricklayer's wages are considerably higher than those of the hodman or tender.

The surface of brickwork is sometimes ornamented by *pointing*. This is done by raking out the mortar of the joints to a small depth, and filling up again with blue mortar, and marking the courses with the edge of the trowel. This is called *flat-joint* pointing. When the courses are marked by a neatly pared raised line of white plaster of about half an inch in thickness, laid upon the blue mortar, it is called *tuck* or *tuck-joint* pointing. Colored bricks, as external ornament, have been extensively and most effectively used in n. Italy and Germany. The works of Mr. Ruskin, Mr. Gally Knight, Webb's *Continental Ecclesiology*, Street's *Brick and Marble of the Middle Ages*, and Fergusson's *Hand-book of Architecture*, may be consulted for illustrated examples of these.

Chromatic brickwork is now becoming extensively used in England, especially by architects who are endeavoring to revive the style of architecture called by themselves English Gothic, and by some others Venetian Gothic, in which the pointed arch, formed of colored bricks, forms one of the prominent features. These architects maintain that, as they are compelled to construct with brick, it is more honest to use bricks ornamentally, than by means of stucco to obtain an external imitation of stone; and as brick admits of but little ornamentation in relief, they use variation of color, of which brick is peculiarly susceptible, and thus produce a sort of architectural mosaic. The eloquent and popular advocacy of these views by Mr. Ruskin, and the skill and enthusiasm with which many young and rising architects are carrying them out, indicate a development, possibly almost a revolution in English domestic and ecclesiastical architecture.

BRICKLE, a. *brĭk'kl:* an older spelling of BRITTLE, which see.

BRICOLE, *brĭ-kōl':* harness worn by men for dragging guns where horses cannot be used.

BRIDAINE, *bre-dān'*, JACQUES: 1701–67; b. Chuslan, dept. of Gard, France: French missionary. His talents and education would have entitled him to ecclesiastical dignities, but he consecrated himself entirely to the work of a travelling preacher of the gospel. He died

near Avignon, while on his 256th journey; and there was scarcely a city or town in the centre and south of France where his voice had not been heard. He was as noted for his lack of bigotry as for his zeal. Though a faithful adherent of the Church of Rome, his Christian kindness led him to protest boldly against the persecution of the Protestants. He published *Cantiques spirituels* (1748). A small collection of his sermons, those that he had written, was published for the first time 1825, Avignon (5 vols.).

BRIDE, n. *brīd* [AS. *bryd;* Ger. *braut,* a bride; Goth. *bruths,* daughter-in-law: Icel. *brúthr,* a bride: W. *priod,* married: Gael. *breid,* a woman's head-dress, a female badge of marriage]: a woman about to be married, or newly married. BRIDAL, a. *brī'dăl* [AS. *brydeale,* bride-ale, the marriage-feast, then the marriage itself]: pertaining to a wedding N. a wedding or marriage. BRIDE- or BRIDE'S-MAN, a male attendant on a bride and bridegroom. BRIDE- or BRIDE'S-MAID, a female attendant on a bride. BRIDE- or BRIDE'S-CAKE, a wedding cake. BRIDE'GROOM, n. [AS. *bryd-guma*— from *guma,* a man: Icel. *bruthgumi;* Ger. *bräutigam:* a bride-groom]: the man about to be married, or newly married. BRIDE-STAKE; a stake or pole set in the ground, round which the guests at a wedding danced, as round a Maypole.

BRIDE, SAINT: see BRIDGET, SAINT.

BRIDE—BRIDAL: referring to a woman about to be married, or newly married, the word bride (the radical signification of which is thought to be 'carried home,' from the usage of carrying her to her husband's house) is common to all the Teutonic languages, and is seen in a well-known Sanskrit root. The word bride, with the addition of the syllable *groom* [a corruption of Ang.-Sax. *guma;* cognate, with Dutch *gom* in *bruidegom,* and Ger. *gam* in *bräutigam,* Lat. *homo*], denotes the man about to be married or newly married [Ang.-Sax. *brydguma*]. Bride is the root of a variety of terms connected with marriage, as bride-favors, bride-cake, etc. Bridal is for *bride-ale* (*ale* being a common name for a feast—there were *scot-ales, church-ales, bid-ales* and *bride-ales*), the marriage-feast. It has been usual from the earliest period of antiquity to pay especial honors to a bride and groom, and in every age and among every people, the wedding-day has been devoted to joyous and solemn ceremonies. It was celebrated among the Athenians by offerings made in the morning to particular divinities, to Zeus and Hera, and especially to Artemis, who was thought to look with disfavor upon marriages. At nightfall she was conducted to the bridegroom's house, in a chariot drawn by a pair of mules, and furnished with a kind of couch, on which she sat between her husband and one of his nearest friends. The bridal procession moved on, greeted and accompanied by

friends bearing nuptial torches and singing songs. Then followed the marriage feast, to which, contrary to the usual Greek practice, women as well as men were invited; and at its close the bride was conducted by the bridegroom to her apartment, where a law of Solon required that they should eat a quince together. On the day after the marriage, presents were made to the newly married couple by their friends. Among the Romans the same custom prevailed, in memory of the rape of the Sabines. The wedding day was fixed, at least in early times, by consulting the auspices. The Roman marriage was usually, though not always, unattended by religious rites. The bride was conducted to the house of the bridegroom by a procession and bore in her own hands the emblems of diligence, a distaff and a spindle with wool. The bridegroom received her within with fire and water, a symbol, perhaps, of purification, and the ceremonies of the day were concluded by a repast given to friends and relatives. The bridal apartment, to which she was conducted by matrons who had not had more than one husband, was magnificently decked with flowers, and minstrels and friends sang without during the night.

In the days of our ancestors various ceremonies, often 'more honored in the breach than the observance,' were followed. The bride was undressed and put to bed by the bridemaids, and the bridegroom submitted to the same operation, at the hands of the groomsmen. Then the posset, a drink made of milk, wine, yolks of eggs, sugar, cinnamon, and nutmeg, had to be served. Then there was sometimes another dilatory proceeding in the sewing of the bride in a sheet. The arraying of the bride in white, the wedding feast, and the giving of presents are ancient customs. As early as the time of James I., the presents received by the bride of Sir Philip Herbert amounted in value to $12,500, a notable expenditure of the kind for those days, but frequently surpassed at the present time by the value of a single bridal gift. The bridal kiss is of unknown antiquity. The old missals, which date long before the 'common prayer book,' enjoined in as an essential part of the marriage ceremony. Moreover, it was always done in church. The priest, too, at one time, enjoyed the privilege of kissing the bride. Groomsmen claimed and took it for a long period. The ordinary accessories of the weddings of our days may mostly be traced to ancient times. The marriage ring probably encircled the finger of the wife of the first Pharaoh, and was certainly used in the Roman ceremonies under the emperors. Its heathen origin nearly led to its abolition by the Puritans of Cromwell's time. The wedding ring is always put and worn on the fourth finger of the left hand, because it was supposed in ancient times that an artery ran from this part directly to the heart. The bride-cake is no less sanctified by antiquity than the ring.

It is a symbol of plenty, and is intended to express the hope that the newly married pair may be always supplied with an abundance of the good things of this life. In ancient days wheat was sprinkled upon the head of the bride with the same intent. At present this custom is superseded by the scattering of rice upon the bride and groom as they leave the house after the reception. The throwing of an old shoe after the couple shows traces of an old superstition. Passing bits of the cake through the wedding ring nine times, and putting them under the pillow to dream upon, was a practice in vogue long before our great-grandmothers lived and loved. Putting up the slices in white paper boxes is an innovation of later times. Wine was an invariable accompaniment of all marriages, long before the marriage feast at Cana. In times past it was customary to drink it in the church, the priest having first blessed the cup, however, to suit it to the holiness of the place. The Jews universally hold to the custom of wine-drinking on the occasion of a marriage. After the bride and groom have drunk from the glass it is broken to remind them of mortality.

Modern custom lengthens out the privileges of bride and bridegroom beyond the wedding day. In former times, when the religious ceremony and the attendant festivities were over, all bridal honors ceased. These are now prolonged by the bridal tour. The term honeymoon, formerly applied to the first month of married life, is now more vaguely used and is sometimes given to the entire period of the bridal tour even though it be extended over many weeks.

BRIDEWELL, n. *brīd'wĕl* [from *St. Bride's Well* in London, near which a palace was built, afterward turned into a hospital, and finally into a place of punishment]: a house of correction; a place where criminals are confined.

BRIDE'WELL: a wall between Fleet street and the Thames, dedicated to St. Bride, which has given its name to a palace, parish, and house of correction. A palace, described as 'a stately and beautiful house,' was built here, 1522, by Henry VIII., for the reception and accommodation of the Emperor Charles V. and his retinue: and King Henry himself also often lodged here, as, for instance, 1525, when a parliament was held in Blackfriars; and 1529, the same regal personage and his queen Catharine, lived in the Bridewell while the question of their marriage was argued. In 1553, Edward VI., gave it over to the city of London, to be used as a workhouse for the poor, and a house of correction 'for the strumpet and idle person, for the rioter that consumeth all, and for the vagabond that will abide in no place.' Queen Mary having confirmed the gift, it was formally taken possession of in 1555, by the lord mayor and corporation. The Bridewell was afterward

used for other persons than the class above named, and at last became a place of punishment, as it now is. As a house of correction, it is not under the sheriff's charge, but is governed by a keeper wholly independent of that officer. See CORRECTION, HOUSE OF.

BRIDGE, HORATIO, American naval officer: b. Augusta, Me., 1806, April 8; d. Athens, Pa., 1893, March 18. He graduated at Bowdoin College in the famous class of 1825, which included Longfellow, Hawthorne, J. S. C. Abbott, and G. B. Cheever. He was admitted to the bar in 1828 and for 10 years was in practice at Skowhegan and Augusta, Me. In 1838 he entered the United States navy as paymaster; made a cruise in the *Cyane* (1838–41); in the *Saratoga* upon the coast of Africa (1843–4), some account of which was published in 1845 under the title *Journal of an African Cruiser*, edited by his friend Hawthorne. From 1854–69 he was chief of the bureau of provisions and clothing. In 1873 he was retired as pay-director with the relative rank of Commodore. He wrote *Personal Recollections of Nathaniel Hawthorne* (1893).

BRIDGE, SIR JOHN FREDERICK, English organist and composer: b. Oldbury, Worcestershire, 1844, Dec. 5. He was organist of Trinity Church, Windsor, Manchester Cathedral, and in 1875 became full organist of Westminster Abbey. He was also made professor of harmony at Owens College, Manchester, and afterward professor of harmony and counterpoint at the Royal College of Music. Among his works are the oratorio, *Mount Moriah;* the cantata, *Boadicea;* the cantata, *Callirhoë;* the oratorio, *The Repentance of Nineveh*, etc. He has set many hymns to music, notably Gladstone's Latin version of *Rock of Ages.*

BRIDGE, a game of cards. It is played with one pack of cards, and the four players are styled the dealer, the leader, the dummy, and the pone. Bridge is allied to whist, and like that game is played in more than one way. See De La Rue, *The Laws of Bridge* (1889); Foster, *Bridge* (1901); Dunn, *Bridge, and How to Play It* (1901); Steele, *Simple Rules for Bridge* (1902).

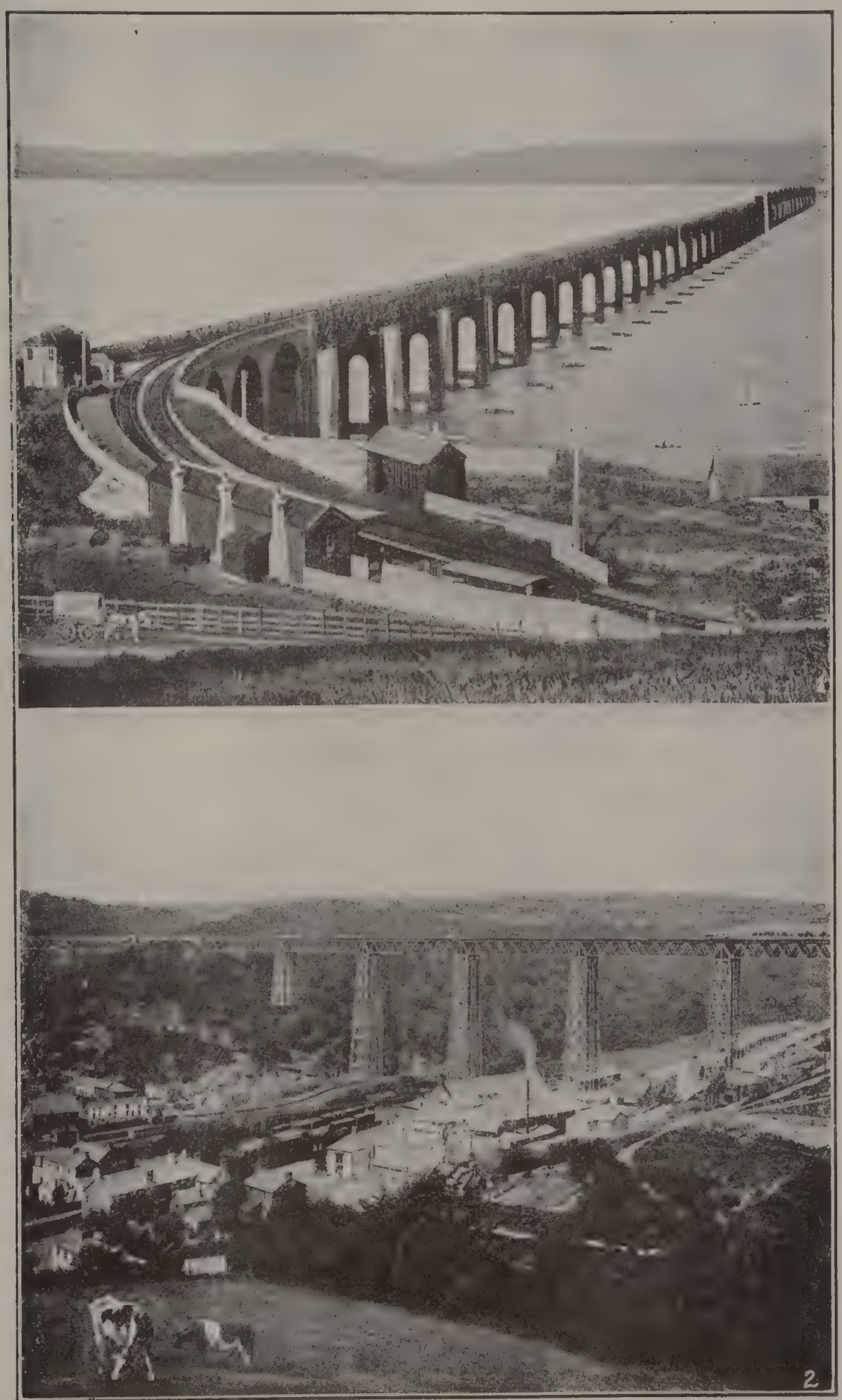
BRIDGE, n. *brĭj* [AS. *bricge;* Icel. *briggja;* Ger. *brücke,* a bridge]: a roadway over an arch or arches or on beams, etc., spanning a river, a valley, etc.; the part of a stringed instrument over which the strings are stretched; upper part of nose: V. to stretch a roadway across, as over a river. BRIDG'ING, imp. BRIDGED, pp. *brijd.* BRIDGE'LESS, a. without a bridge. DRAW-BRIDGE, a short roadway over a ditch or water that may be drawn up or swung aside temporarily. FLYING-BRIDGE, a temporary bridge or floating structure made over a stream. PONTOON-BRIDGE, a temporary bridge across a stream, made upon floating bodies. SUSPENSION-BRIDGE, a floor or passageway hung on two or more

wire cables or chains, and stretching from bank to bank of a river, or from pier to pier. TUBULAR-BRIDGE, an enormous tube, or series of them, formed of wrought-iron plates, and supported upon piers, the roadway being in the interior. SWING-BRIDGE, a bridge which moves on a central pier, moved or swung aside to allow the passage of vessels. BRIDGE'-BOARD, in *arch.*, a notched board on which the ends of the steps (technically the treads and risers) of wooden stairs are fastened; a notch-board.

BRIDGE: structure for bearing a road over a stream, river, ravine, low ground, etc. A bridge for bearing a canal or other water-course, is called an aqueduct (q.v.); one for carrying a railway is sometimes called by the recently coined, though not very correct, word *viaduct* (q.v.). Bridges are formed of stone, brick cast-iron, or timber arches; of timber beams or framework, supported on piles or on masonry; of iron rods or chains, in which case they are called suspension-bridges; of lattice-work; or of cast or wrought iron girders. Sometimes a combination of beams and suspension-rods is used. Of late years, the plan of tubular or hollow wrought-iron girders has been frequently and successfully employed, the first great example being the Britannia Bridge.

Bridges are either fixed or movable. Of movable bridges there are various kinds. *Flying-bridges* and *floating-bridges*, are, in fact, mere ferry-boats (see FERRY) with gangways attached, and other provisions for safe and ready transport, and which are drawn across the stream by ropes. *Draw-bridges* and *swing-bridges* are constructed in two parts, that turn on pivots —the parts are either lifted vertically, or moved round horizontally. A *sliding-bridge* runs backward and forward on wheels or rollers. Another kind is much in use in low districts like Norfolk, Eng., where the water flows lazily, and almost on the land-level. These are sometimes called pontoon-bridges, from the movable roadway being balanced at a small height above the water level on a pivot working in a large pontoon or hollow cylinder sunk in the bed of the river—the ends of the roadway of the bridge, when laid across the river, resting freely on piers on either side. There are several such bridges over the Ouse. The pivot is set in the centre of the stream, and, when necessary, the bridge is turned round on it by machinery, till it lies parallel to the banks, and permits the passage of barges on either side. In a flat district, these bridges are exceedingly appropriate.

History.—The construction of a bridge as an engineering structure, although quite elemental in its engineering features, may be traced back more or less accurately to the Chinese who appear to have been the



1. Tay Bridge from North End
2. Crumlin Viaduct.

first people to employ the masonry arch for the purpose of continuing roadways across streams.

The art of bridge-building, however, as developed in the various countries was not evolved from the earlier Chinese practice, but independent effort characterizes its development in each country.

The Egyptians seem to have had but little use for bridges, and none have survived among the structures of their ancient civilization. Similar conditions appear to have obtained among the Balylonians and the Assyrians, and the earliest examples that remain, other than those of the Chinese, appear to belong to the 'Hittite' and 'Pelasgic' tribes, who inhabited the shores of the Mediterranean Sea during a pre-historic period antedating that of the building of Troy. Their engineering methods appear to have been imitated by the Cretans, whose cities in Asia Minor, Greece, and Italy, and in the countries bordering on the Mediterranean, were connected by macadamized roads which required bridges that were constructed by a high order of engineering skill. They were somewhat similar to the one built at a later period across the Euripus in Euboea, a province of Greece, and consisted of massive abutments and piers of masonry with a connecting superstructure of planks. The typical Greek method is shown by the bridge at Assos, in which parallel stone lintels doweled together are employed to connect the piers and abutments.

On the other hand, the engineering genius of the 'Pelasgic' tribes was inherited and developed by the Etruscans and the Romans in the application of the basic principles of the arch.

The bridges at Vulci, Bieda, and Cora, in Italy, in which true round arches are employed to connect the piers are a class of structures which were probably unknown to the Greeks. These were built during the seventh and sixth c. B.C., and the Roman bridge-building methods were carried through stages of greater and greater perfection until the fourth c. B.C., when the Roman policy of constructing great military roads to bind their possessions together, permitted the highest development of their engineering skill, in structures of this kind.

The brilliant and unrivalled career of bridge and viaduct construction thus inaugurated by the building of the famous Via Appia, and culminating in the erection of eight great bridges of Rome, has furnished models for all the succeeding centuries, and are applicable to-day to the construction of stone structures.

Some of the bridges of the Republican period still remain. Of these, the Ponto Lupo, and the viaduct for the Anio Vetus Aqueduct was built about 143 B.C., and consists of great stone arches of tufa and travertine; while the viaduct near Gabii, built about 122 B.C., consisting of seven arches about 292 feet long, is

still in use. Within Rome itself, the Æmilian bridge, built in 179–142 B.C. across the Tiber, is supposed to have been the first stone bridge to span that stream, all the others having been constructed of wood, a material which continued in use until quite a late period for bridges across wide rivers. Another, the Sublician bridge built by Ancus Martius across the Tiber between the Janiculum and the Aventine Mountain was famous for its defense by Horatius Cocles against the great army under Lars Porsena. The only one of the urban bridges of Rome that remains intact is the Fabrician Bridge, or 'Ponte Fabrico,' built in 62 B.C., but the greater part of the most magnificent of them all, the Ælian Bridge, or 'Ponte Sant' Angelo,' built by Hadrian in 136 A.D., also remains.

Of the important bridges built on the great military roads of the Empire—the Appia, the Aurelia, the Flaminia, the Via Salaria or Pont Salaro, the Cassia, the Valeria, the Latina, and the Æmilia, those built during the Augustan period were the most remakable. The Flaminia commenced at the Mulvian Bridge and ended at the Ariminium (Rimini) Bridge. The latter, which consists of five great arches with a total length of 236 ft., is the best preserved of them all; but vestiges of a great many others still remain, the most important being those near Narni and Borghetto, the great one of Vincenza, rebuilt at Verona, and those near Aosti and Calzi.

With the expansion of the Empire many bridges were built upon the fine macadamized roads which connected the various provinces with the Eternal City, by the Roman legions under the direction of their skillful military engineers. Of these, the greatest was the bridge across the Danube, built in 103 A.D., by the engineer Apollodorus, to enable the Emperor Trajan to conquer Dacia. It consisted of massive stone piers connected together by a superstructure of wood with a total length of 4,770 ft. It was subsequently destroyed by Hadrian, but the great piers are still standing.

The early history of Oriental bridge-building appears to extend back to the days and works of Semiramis, who is credited by Diodorous Siculus, with the construction of a bridge across the Euphrates at Babylon about 776 B.C., and is described by him as a movable drawbridge, 30 ft. wide, supported by stone piers.

The earliest existing examples of Oriental work, however, appear to be the bridges at Dizfel and Shuster, in Persia, which were probably built during the rule of the later Achæminid Kings over Iran, about 350 B.C. Their design embodies the wide pointed arch characteristics of later Mohammedan architecture, and are still in a fair state of preservation. The science and art of bridge-building was practically lost in the European countries during the six centuries which comprised the Dark Ages. In the 12th c., however, the architectural

and engineering sciences felt the awakening impulses which culminated in the magnificent structural creations of the Renaissance. The revival was first experienced in Italy and France. Bridges were built at Tours, Orleans and Vienna, and many other large cities, and the Rhone was spanned at Lyons and Avignon by two fine bridges, the last-named being about 3,000 ft. in length. It was built during the years 1178–88, by Benezet, a shepherd mason, who subsequently founded an association of bridge-builders which was known as the Frères Pontiers, or 'Brethren of the Bridge.' It is remarkable on account of the elliptical curvature of the arches, the radius of which is shorter at the crown than at the haunch, and, therefore, conforms more nearly to the linear equilibrated arch, than the modern elliptical arch which has the longer radius at the crown. It consisted of 19 arches. The span of the largest arch was 110 ft. 9 in., with a height of 45 ft. 10 in. Four of the arches still remain.

The bridges built in southern France were particularly fine. The Saint Esprit, the Beziers, the Montauban and the Pont Valentré; at Cahors, are some of the best examples of those built during the period covered by the later part of the 13th and the earlier part of the 14th centuries. The application of the system of end and central towers for purposes of fortifications, received the highest development at this time. This was especially true in France where the mediæval social conditions made such fortifications an absolute necessity. In this respect, Germany and Spain were far behind France, although the monumental bridge across the Danube at Ratisbon, built by the Germans in 1135, and the bridge across the Elbe at Dresden, were very fine examples of this kind. Also, the Spanish bridges at Zomora, Tudela, Lograno, and Palencia, built during the period 1135 to 1192. These bridges are of the pointed arch type, some of them consisting of as many as 20 arches. Of the Italian bridges built during this period, the best examples are the Ponte Vecchio in Florence, built in 1362, the bridge at Mantua, and the Rialto Bridge over the Grand Canal in Venice, built in 1588. In Italy, the use of wood as a material of construction was generally adhered to until the 13th c., although in France, and in the other countries of northern Europe it had been generally supplanted by masonry. Yet, at the close of the 15th c., Italy had some fine stone structures—the bridges at Mossa and Signa in Tuscany, and the Ponte del Diavolo near Lucca; while France had many large wooden bridges at several important points.

The engineers of the Renaissance returned to the round arch typical of the Roman bridges, but they showed great boldness in their designs, by increasing the span of the arches. The bridge across the Adda at Trezzo, built under the orders of Bernabo Visconti,

Duke of Milan, during the latter part of the 14th c., consisted of a single arch of granite with a span of 251 ft.; while the bridge over the Ticino at Pavia, consisted of seven pointed arches of brick work, each 70 ft. in span, and 64 ft. in height.

In England, the use of stone as a material of construction may be traced back to the middle of the 10th c., by records which authorized the building of a triangular pointed arch stone bridge at Croyland, Lincolnshire, in 943. The present structure, known as the Croyland Bridge, however, although one of the oldest stone bridges in England, appears to have been built about the latter part of the 14th c.

The work of the 'Brethren of the Bridge' order, carried the art of bridge-building up to the 17th c., and a great many fine structures were built in all parts of Europe. In France, the most important were the Trilpot, Tours, Gignac, Neuilly, and Blois Bridges, and in England, the Blackfriars, Westminster, Winston and Kelso. The so-called great London Bridge was built of stone, between the years 1176 and 1209, by an architect sent from France for that purpose. It consisted of nine pointed arches, each 60 ft. in span, and had a total length of about 700 ft. It was supplanted by the structure now known as 'Old London Bridge,' in 1831. This structure consists of five elliptical arches, of which the center arch has a span of 152 ft., with a height of 29½ ft. above high water mark. The other arches are 140 ft. in span, with a height of 27½ ft. The total length of the structure is 1005 ft., and it carries a roadway 53 ft. wide between the parapets. The Blackfriars Bridge across the Thames was built between the years 1760 and 1770. It consists of nine elliptical arches. The central arch has a span of 100 ft., and the others decrease gradually from 98 ft. in those next to the center, to 70 ft. in those at the ends. The Westminster Bridge was built between the years 1738–50. It consists of 15 arches, of which the center arch is 76 ft. in span, and the span of the others decreases at the rate of four ft. for each succeeding arch, except the two shore arches, each of which have a span of 25 ft. Other notable English stone bridges built during the 18th c., are the Winston Bridge over the River Tees, and the Kelso Bridge over the Tweed. The former has a superb arch 109 ft. in span, while the latter consists of five arches, each of which are 72 ft. in span. Perhaps the most notable stone arch bridge built in any country during the 18th c., is the Pont-y-tu-prydd, across the River Taff in Wales. It was built by William Edwards, an ordinary stone mason, in 1750, after two failures due to excessive weight of the haunches, which in the third and successful attempt were lightened by the introduction of pierced spandrils. It consists of a segmented arch 140 ft. in span, with a height of 35 ft., and its most curious feature is the gradual

increase of its width from 14½ ft. at the crown of the arch to 16 ft. at the abutments.

The most remarkable bridges constructed in France during the 18th c., were the Blois Bridge over the Loire, the construction of which was commenced in 1720, and which consists of 11 elliptical arches, ranging from about 55 ft. to 86 ft. in span; the bridge over the Loire at Tours, the construction of which was commenced in 1755, and which consists of 15 elliptical arches, each 80 ft. in span, and separated by piers 16 ft. thick; the Trilport Bridge over the Maine, built in 1760, consisting of three skew arches, the middle arch of which has a span of 81 ft., and the side arches, spans of about 77 ft.; the Neuilly Bridge across the Seine, built between the years 1768 and 1774, and which consists of five elliptical arches, each 128 ft. in span; and the Gignac Bridge over the Herault, built in 1793, and which consists of an elliptical center arch about 107 ft. in span, flanked by two semicircular arches, each of which have a span of 83 ft.

Of 19th c. productions, the largest stone arch in the world is that of the Luxemburg Bridge, completed in 1901; it is 277 ft. in span, and rises to a height of about 138 ft. above the level of the water. Other modern stone arches of magnitude are the Grosvenor Bridge over the River Dee at Chester, England, consisting of a single arch with a span of 200 ft., and the Cabin John Bridge near Washington, D. C., built in 1853–59, to carry the Washington aqueduct, which consists of a single arch with a span of 220 ft.

This brief enumeration of the notable 19th c. stone arch bridges may be terminated very appropriately with the mentioning of the Waterloo Bridge across the Thames. It consists of nine elliptical arches of Aberdeen granite, of 120 ft. span each, with a rise of 32 ft. The total length of the structure, including the approaches, is 2,456 ft., and it carries a horizontal roadway 41½ feet wide between the parapets.

About the beginning of the 19th c., metal began to be extensively introduced as a material of construction, and although the masonry arch was superior in beauty and durability, the metal bridge gave greater strength in proportion to the weight of the structure; was capable of being built more quickly and cheaply, and therefore, being better adapted to keep pace with the tremendous activity of modern railway construction, it soon almost completely supplanted the stone structures.

The first structure in which the new material was used appears to be the bridge across the Severn near the town of Ironbridge, Shropshire, England. It was built by Abraham Darby, the owner of the iron-works of Coalbrookdale, in 1779, and consists of a single arch 100 ft. in span, with a rise of 45 ft. The arch is composed of five cast-iron ribs which form the segment of a circle. The successful construction of such a struc-

ture being thus clearly demonstrated, several others, of bolder design, were built during the last quarter of the 18th c., of which the Wearmouth Bridge, over the Wear at Sunderland, completed in 1796, is the most elegant example of the type. As originally constructed, it consisted of a single arch 236 ft. in span, with a rise of 34 ft. above the springing lines, whicl were 95 ft. above the level of the river.

From these beginnings, the evolution of various types of metal arch structures was rapid. A larger percentage of wrought iron was employed in the material of construction, affording greater flexibility in the methods of construction and design, and the capability of spanning greater intervals with single spans. The most notable of the structures built about this time (the early part of the 19th c.) was the Southwark Bridge across the Thames, erected in 1819. It consists of three arches, of which the central arch is 240 ft. in span, and the side arches 210 ft. each. They are composed of massive cast-iron arch ribs, which being set without any provisions to counteract the effects of expansion, and being much heavier than is necessary to sustain the loads to which they are subjected, gives a structure which is merely the imitation of one of stone, with the additional fault of a great wastefulness of the material of construction.

Although the fine cast-iron bridges such as the Westminster and the Blackfriars, built across the Thames during the period covered by 1860 to 1870, consisted of arches with spans as great as 185 ft, the metal hinged-arch bridges built since 1873, have surpassed them greatly, not only in the length of the spans, but in the economy of the material of construction.

An exception to this statement, however, must be noted in the case of the bridge across the Mississippi, at St. Louis, Missouri, which was completed in 1874. It consists of three arches, without hinges, the centre arch being 520 ft. in span. Of the hinged-arch bridges, the following are the most notable. The Alexander III. Bridge across the Seine at Paris, built in 1899, consisting of a single arch with a span of 362½ ft. composed of arch-ribs made up of wedge-shaped cast-steel sections bolted together; the steel-arch railway bridge across the Niagara River, built in 1897, consisting of a single arch with a span of 550 ft.; and the highway and foot-bridge completed in 1899 across the Niagara Gorge, just below the Falls consisting of a single steel arch with a span of 840 ft., which makes it the largest single span steel-arch bridge in the world, and is approximated to in size only by the steel-arch of the Viaur Viaduct in France, which is 762 ft. in span.

Some of the other handsome and important structures of the metal hinged-arch type well worthy of mention are the following: The Washington Bridge

over the Harlem River, at New York, completed in 1889, which consists of two magnificent arches, each 510 ft. in span, flanked by four masonry arches at one end, and three at the other, each 50 ft. in span; the German steel-arch bridges across the Rhine at Bonn and Düsseldorf, the former with a central arch of 614 ft. span, and two side arches each 307 ft. in span, and the latter with two arches each 595 ft. in span; the Pia Mia Bridge over the Douro at Oporto, Portugal, consisting of a main steel arch, 525 ft. in span with a rise of 123 ft.; and the steel arch on Garabit Viaduct over the Truzere, in central France, which has a span of 540 ft. with a rise of 170 ft.

As the tensile strength of wrought iron and steel was greatly increased by improved processes of manufacture, greater feats of bridge-construction were dared by the bridge engineers, and various types of suspension and cantilever bridges, especially suitable for very long spans, were designed and successfully erected. Even the more important wire cable and chain structures of the early 19th c., such as the Schuylkill River Bridge, at Philadelphia, built in 1816, with a span of 408 ft.; the bridge across the Menai Strait, between the Island of Anglesey and Carnarvonshire, in Wales, completed in 1826, with a span of 580 ft. and Fribourg Bridge, in Switzerland, built in 1834, with a span of 870 ft., were completely overshadowed by the works of the American engineers during the period dating from 1848 up to the present time. Of these magnificent structures, the most notable are the following: The bridge at Wheeling, West Virginia, erected by Charles Ellet, in 1848, with a suspension span of 1,010 ft.; the Niagara Bridge, built by John A. Roebling, in 1855, with a clear span of 821 ft., and particularly distinguished as the first railway suspension in the world; the Cincinnati and Covington Bridge, built by the same engineer, in 1867, with a clear span of 1,057 ft., and a total length of 2,252 ft.; and the last creation of the same engineer, the 1st New York and Brooklyn Suspension Bridge, across the East River, which was completed in 1883. This structure consists of a main suspension span of 1,595½ ft., and two short spans of 930 ft. each. Four steel-wire cables, each 15¾ in. in diameter, support the roadway platform and the stiffening trusses at a height of 135 ft. above the level of the water, at the center of the span. It has a total length of 5,989 ft., of which 2,492 ft. belong to the New York approach, and 1,901 ft. to that on the Brooklyn side. The roadway, 85 ft. in width, is divided into five sections—the two on the outer sides for vehicles and electric surface cars, the two on the inner side for electric elevated cars and the 'bridge cars' operated by cables, and the central division for foot passengers. The ca-

bles are carried over saddles on the tops of two stone towers, each 278 ft. high, and anchored at each end in solid cubical structures of stone masonry 119 ft. by 132 ft., which rise to a height of 90 ft. above high water mark, and weigh 60,000 tons each. The suspension span has a weight of 7,000 tons, which is supported by the four cables already described, each of which are estimated to have an ultimate strength of 11,200 tons. The total cost of the structure was $9,000,000. The second suspension bridge connecting the Boroughs of Manhattan and Brooklyn, of the City of Greater New York, crosses the East River at a point about two miles above the New York and Brooklyn Bridge already described, and was completed in 1904. This structure is commonly known as the Williamsburg Bridge. It has a clear span of 1,600 ft. and a total length of 7,200 ft. between the terminals. Four steel-wire cables, each 17½ in. in diameter, swung from two steel towers each 235 ft. high, support the roadway platform and the stiffening truss at a height of 135 ft above the water level at the center of the span. The roadway platform 118 ft. in width accommodates two elevated railway tracks, four electric surface-car tracks, a driveway for ordinary vehicles, two bicycle tracks, and two foot-paths. It differs from the first East River Bridge in that the towers are of steel instead of masonry; that the shore spans are supported independently of the cables, and in the use of the riveted instead of the pin-connected method of construction in the stiffening truss.

The suspension principle has been far more extensively employed in America, and especially in the United States, than in foreign countries. Some of the European suspension bridges, however, are of great beauty of design, such as the structure across the Danube, at Buda-Pesth in Austria-Hungary, which is considered to be the handsomest bridge in the world; but, they are entirely outclassed in magnitude by the almost marvelous creations of American engineering genius already described.

In order to trace the evolution of the cantilever-bridge from the girder, and to understand its relation to the truss, a brief mention of the tubular bridges which were originated by Robert Stevenson, engineer of the Chester and Holyhead Railway, England, to carry that railway across the Menai Strait is necessary.

A series of experiments conducted by Stevenson in conjunction with Fairbairn, demonstrated that a rectangular tube with a cellular top and bottom, gave a girder in which the greatest strength was derived from the least amount of material. The result was the construction of the Conway and Britannia Bridges, the former across the Conway River and the latter across the Menai Strait, in 1846 and 1847, respectively. The Conway tube consisted of a single span of 400 ft., and

1. Forth Bridge from North Queensferry.
2. Britannia Tubular Bridge.

the Britannia of four spans, two of 460 ft. each, and two of 230 ft. each in the clear. The example set by Stevenson was followed in a few other cases, the most important of which was the Victoria Bridge across the St. Lawrence, near Montreal, Canada, built in 1854. It consisted of 24 spans ranging in length from 242 to 247 ft. each, and one span of 330 ft. It had a total length of 9,144 ft., or nearly one and three-quarter miles, and required about 9,000 tons of iron for the construction of the tubes. It was replaced in 1898–99, by a pin-connected truss bridge of 24 spans of 254 ft. each, and one span of 348 ft., which represented a total weight of 20,000 tons of steel, but which was capable of sustaining a load five times greater.

In the meantime, the principle of the truss, first enunciated by Palladio, the famous Italian architect, about 1560, and subsequently developed still further, and without doubt independently, by such genius' as Ulric Grubermann, Timothy Palmer, Lewis Wernway, Theodore Burr, William Howe, Wendall Bollman, and others of equal merit, during the period extending from 1754 to 1854, was diverted from its application to wooden bridges, and used in the construction of metal structures. The combining of the truss and the girder was the next logical step in the evolutionary process, and to Roebling belongs the credit of demonstrating the practicability of building long span braced girder or truss bridges with iron and steel as the material of construction. As the cantilever bridges are a class of structures actually composed of hinged continuous braced girders, their intimate relation to the girder and truss bridges is quite obvious. They were, however, not much used until the last quarter of the 19th c. The construction of the Kentucky Viaduct in 1876, and the Niagara Cantilever in 1883, demonstrated the ease with which they could be built without the use of costly false work, and soon afterwards many bridges were built both in Europe and America. The most important of these are the following: The bridge across the Hudson at **Poughkeepsie,** New York, built in 1889, which consists of five river spans ranging from 546 to 548 ft. in length, and a total length of 6,767 ft.; the Red Rock Cantilever Bridge across the Red River in California, built in 1890 with a center span of 660 ft., and a total length of 990 ft.; the Memphis Bridge across the Mississippi River at Memphis, Tennessee, built in 1892, with a truss span of 621 ft., and two cantilever spans of 700 ft. each, which are the longest of the kind in the United States; the St. John River Cantilever in New Brunswick, built in 1895, with a main span of 477 ft., and a total length of 813 ft.; the great Forth Bridge across the Frith of Forth, in Scotland, which was completed in 1890, and consists of two shore spans of 680 ft. each, and two main spans of 1,710 ft. each, which were the longest cantilever spans in the

world until the building of the Quebec Cantilever across the St. Lawrence River, the construction of which began in 1900, and which has a clear span of 1,800 ft.

Types of Bridges.—All bridge structures, regardless of the materials of construction, may be divided into three classes—'Beam Bridges,' 'Suspension Bridges,' and 'Arch Bridges,' which in turn may be subdivided into several other classes according to their modern uses,—such as Railway Bridges, Highway Bridges, Movable Bridges, Pontoon Bridges and Military Bridges.

Modern railway bridges are almost exclusively constructed of steel, and consist of trusses or plate girders designed to sustain uniform loads ranging from 3,000 to 4,800 pounds per linear ft. of track, according to the length of span and the service required.

Highway bridges include all bridges used for roadway purposes alone. They may be constructed of wood, metal, masonry, or concrete, and are usually designed to sustain uniform loads ranging from 1,000 to 1,800 pounds per linear ft. of track, according to the length of span and the service required.

Movable bridges or drawbridges include the various types of structures over rivers, that can be moved in order to allow a clear passageway for vessels.

The modern structures of this type may be divided into the following classes: (1) Swing Bridges; (2) Rolling Bridges; and (3) Lift Bridges; of which the first are the most commonly used.

A swing bridge consists of a wooden or metal truss supported at the center by a pier located in the middle of the stream, so that when the bridge is closed, the ends of the truss rest upon abutments on the shores on either side. It is operated by a turntable, upon which it rests, which is revolved by a rack and pinion arrangement worked by hand power, steam, or electricity.

A rolling bridge consists of a single truss mounted on rollers, and which is pushed out from one side across the span, or of two trusses, on each side of the span which are pushed out and connected at the center of the span where the water ends are locked together when the bridge is closed. It is operated by the rope and drum method, and is not used to any great extent.

Lift bridges are of various kinds—the 'vertical lift,' the 'hinged lift,' and the 'rolling lift' bridges. The simplest is the vertical lift bridge consisting of a truss which is raised vertically to the desired height, both ends rising in guides arranged on towers. The hinged lift bridge is raised by being revolved in a vertical plane around hinges at one end. The rolling lift bridge is also lifted in a vertical plane, but has in addition a limited rolling motion. All lift bridges usually have a counter-weight to assist the lifting effort, and are generally designed to move quickly—one minute being frequently specified as the time of opening

or closing at points where land and water traffic is heavy.

The longest swing bridges ever constructed are the Interstate Bridge at Omaha, Nebraska, which has a total length of 520 ft.; the Thames River Drawbridge at New London, Connecticut, which has a length of 503 ft.; and the Anthur Kill Drawbridge between Staten Island, New York, and New Jersey, which has a swing span of 496 ft.

The most notable of the hinged or pivot-bascule bridges are the Tower Bridge across the Thames, near the Tower of London, England, which consists of a suspension and drawbridge combined with a central bascule span of 200 ft., formed by two leaves or trusses, hinged at the opposite towers; and the bridges at Chicago, Milwaukee, Buffalo, and Boston, in the United States.

The modern pontoon bridges are a development of the ancient bridge-of-boats principle. The most notable example of the type is the pontoon bridge across the Hooghly River, at Calcutta, India, which briefly described will serve to convey a very satisfactory idea of such structures. It is 1,530 ft. in length between the abutments on each bank of the river, and consists of a superstructure carried on 14 pairs of pontoons in the form of rectangular iron boxes with rounded bilges and wedge-shaped ends, which are held in position across the river by means of chain cables laid across, and anchors laid up and down the stream. The superstructure consists of trestle-work, which carries a plank roadway and footpath platform having a total width of 62 ft. at a height of 27 ft. above the surface of the river. This height is sufficient to allow ordinary boat navigation, but the passage of large vessels is provided for by arrangements which permit the opening of a span 200 ft. wide, by the temporary removal of four of the pontoons and the superstructure carried by them, twice a week.

The use of reinforced concrete in the construction of bridges has proved so satisfactory that concrete steel spans of much greater length than those already built have been designed by several well-known engineers, of which perhaps the most interesting and instructive is one by William H. Burr, professor of civil engineering, Columbia University, for a memorial bridge across the Potomac at Washington, D. C. The design was submitted in competition with others at the request of the chief of engineers of the United States army and was awarded the first prize. It calls for a bridge proper composed of a centre-draw span of steel, 159 feet long, flanked on each side by three segmental arches of concrete steel, 192 feet long, with a rise of 29 feet. They are of the ribbed type, with exterior ribs of granite masonry, and interior ribs of concrete steel 30 inches deep at the crown, and 7 feet 3 inches deep at the springing lines.

The great value of reinforced concrete has not only been satisfactorily demonstrated in its application to bridge work, but also as a material for many other forms of structures usually built of iron or steel and steel and masonry combined. It is well known that the average life of iron or steel railroad bridges is about 20 years at the most, while a great many deteriorate rapidly under the influence of heavy traffic, atmospheric conditions, and the effects from gases from the locomotives, and have to be replaced in a much shorter time; but, although they cannot compete in durability with masonry structures, the cheapness of iron and steel renders them more economical, while for bridges of long spans no other material is available. Examples of bridges with reinforced concrete floors are quite numerous, and the application of the system is being rapidly extended both in the United States and Europe.

BRIDGE, MILITARY: temporary construction, to facilitate the passage of rivers by troops, cannon, and military wagons. The most efficient are Pontoons (see PONTOON); but there are many other kinds. A *bridge of boats* is formed by small craft, especially flat-boats, scows, etc., collected from various places up and down the river; trestles are placed in them to bring their tops to one common level; the boats are anchored across the river, and balks of timber, resting on the trestles, form a continuous road from boat to boat across the whole breadth of the river; the boats ought to be of such size that, when fully laden, the gunwales or upper edges shall not be less than one foot above the water. *Rope-bridges* are sometimes but not often used by military engineers. A *boat-and-rope bridge* consists of cables resting on boats, and supporting a platform or road of stout timber. A *cask-bridge* consists of a series of timber-rafts resting on casks; the casks are grouped together in quadrangular masses; at certain intervals timbers are laid upon them to form rafts, and several such rafts form a bridge; it is an inferior kind of pontoon-bridge. A *trestle-bridge* is sometimes made for crossing a small stream in a hilly country; it consists of trestles hastily made up in any rough materials that may be at hand, with planking or fascines to form a flooring, cables to keep the trestles in a straight line, and heavy stones to prevent them from floating. *Raft bridges*, consisting of planks lashed together, are easily made of any rough materials that may be found on the spot; but they have little buoyancy, and are not very manageable. A *swing flying bridge* consists of a bridge of boats, of which one end is moored in the center of the river, and the other end left loose.

BRIDGE-BUILDING BROTHERHOODS (Fr. *Frères pontifes;* Lat. *Fratres pontifices*): religious societies that originated in the s. of France in the latter half of the 12th

c. Their purpose was to establish hospices at the most frequented fords of large rivers, to keep up ferries, and to build bridges. The church during the middle ages regarded the making of streets and bridges as meritorious religious service. Whether or not the herdsman Benezet, subsequently canonized, was the founder or only a member of this fraternity, is as uncertain as the tradition which attributes to him the completion of the bridge over the Rhone at Avignon 1180. The fraternity was sanctioned by Pope Clemens III. 1189; its internal organization was similar to that of the knightly orders, and the members wore as their badge or insignia a pick-hammer on the breast. In France, they labored very actively, but were gradually absorbed into the order of St. John. Similar associations sprang up in other lands, under different names.

BRIDGE'-HEAD, or TÊTE-DE-PONT, *tāt-dė-pōng*, in Military Engineering: fortified post intended to defend the passage of a river over a bridge. It is a field-work, open at the gorge or in the rear, and having its two flanks on the banks of the river. The most favorable position is at a re-entering sinuosity of the river, where the guns can work better with the supporting batteries opposite. Bridge-heads are usually

Bridge-head Defense Work.

temporary works, hastily constructed. Their most frequent use is to aid a retiring army to cross the river in good order, and to check an enemy pressing upon it. Openings are left to allow the retiring army, with guns and carriages, to file through without confusion, and parapets are so disposed as to flank and defend these openings.

BRIDGENORTH: town of Salop or Shropshire, on both sides of the Severn, 20 m. s.e. of Shrewsbury. It consists of an upper and lower town, connected by a bridge over the Severn. The larger part of the town is on the right bank, and is built on a sandstone rock 60 ft. above the river. The navigation of the Severn formerly employed many of the inhabitants, but the traffic is now mostly by railways. The town, anciently called *Bruges* or *Brug*, is said to be of Saxon origin. In the beginning of the 12th c., the Earl of Shrewsbury defended it unsuccessfully against Henry I. It was besieged in the same century by Henry II.; and during the civil wars it resisted the parliamentary forces for three weeks. Pop. about 6,000.

BRIDGEPORT.

BRIDGEPORT, Conn., city, port of entry, and county-seat of Fairfield co., situated on Long Island Sound, and on the N. Y., N. H. & Hartford R. R., 58 miles n. e. of New York and 18 s. w. of New Haven. It is the third city in the State, the city and county being conterminous. The first settlement was made here in 1639, on lands bought from the Paugusset Indians, who 20 years later were relegated to a reservation on Golden Hill, now the choice residence district. It was called Pughquannock, or Pequonnock, and formed a parish in the towns of Fairfield and Stratford, where the people attended church until they built one for themselves in 1695. In 1703 the first school building was erected, school having previously been conducted in the church during week-days. The town was a center of privateering enterprises during the Revolution, and a company of B. men joined Arnold's expedition against Quebec. The first newspaper, the *American Telegraphe*, was issued here in 1795. In 1800 the borough of B. was incorporated, including the village of Newfield, which had grown up at the water-side, the older settlements having been along the 'Old Stage Road,' now in part North Avenue. In 1821 the town of B. was set off, with a population of 1,700 and an assessed valuation of property amounting to $24,701. The first steamboat ran from Derby past B. to New York, Sept. 28, 1824; and on the 16th of April, 1832, the first steamer between this place and New York, the *Citizen*, began its regular trips. The Housatonic Railroad was opened to New Milford in Feb., 1840; and the N. Y., N. H. & H. began running to Fairfield, Sept. 2, 1848, and to New York, Jan. 1, 1849. This was the beginning of the great development of the city, which occurred between 1850-60. Water was introduced 1854-5, and gas in Dec., 1861. About 1850 P. T. Barnum bought large tracts of land in E. B., and laid them out in streets, parks and lots, and a new era of improvement set in. In 1856 the Wheeler & Wilson Sewing Machine Co. brought their works here from Watertown and greatly enlarged their facilities; the Howe Co. followed them in 1863, and the Union Metallic Cartridge Co. in 1865. In 1870 the city annexed a part of Fairfield; and in 1899 Summerfield, and W. Stratford across Pembroke Lake.—The present assessed valuation is about $64,000,000, city debt $1,275,000, and the tax rate is $13 per $1,000. The annual outlay is about $1,000,000, the largest item, $170,000, being for schools. By census of 1900 there were 832 manufacturing establishments in the city, employing 20,462 workmen and supervisors, and paying in salaries and wages $10,622,558; capital employed, $33,066,890, and finished products, $37,883,721. These figures do not include the most noted products, sewing machines and ammunition, which are concentrated in two or three establishments;

there is a large output of brass castings, corsets, foundry and machine shop products, hardware, cutlery and edged tools, rubber goods, carriages and wagons, etc. The city has four daily and several weekly newspapers, and its school facilities are equal to any in the country. It has no less than 57 churches of the various denominations; and there are three handsome parks, embracing 250 acres in all. Pop. (1910) 102,054.

BRIDGES, *brĭdj'ĕz*, FIDELIA, American artist: b. Salem, Mass., 1835, May 19. She studied art under William T. Richards in Philadelphia; has been associate member of the National Academy of Design from 1869, and of the American Water Color Society from 1870. She has done much landscape work, her earlier paintings being mainly executed in oil, while her later ones are usually in water colors.

BRIDGES, ROBERT, American iron-worker: extremely little is known of him personally. He settled at Lynn, Mass., and in 1643 organized a company to work the deposits of 'bog iron-ore' in that vicinity. He went to London, and organized a 'Company of Undertakers for the Iron Works,' comprised of wealthy Englishmen, who advanced £1,000 for the work. Foundrymen were brought from England and Scotland, a plant was established on the Saugus river, and for several years furnished most of the iron used in this country, though ultimately the undertaking failed, owing to the scarcity of money and difficulty of making collections. In 1645 Bridges was a commissioner to confer with the governors of the French provinces in Canada. The Colonial records show him to have been a member of the general court, and its speaker in 1646.

BRIDGES, ROBERT, English poet: b. 1844, Oct. 23. Educated at Eton and Corpus Christi College, Oxford, he afterward studied medicine and held several hospital appointments, retiring from the active exercise of his profession in 1882. He is one of the most scholarly of modern English poets and has published, usually privately, eight plays and several collections of poems. Among his works are *Prometheus; Achilles in Scyros; Eros and Psyche; Shorter Poems; Milton's Prosody.*

BRIDGES, ROBERT, American author: b. Shippensburg, Pa., 1858, July 13. After graduating at Princeton he joined the staff of the New York *Evening Post*, and later became assistant editor of *Scribner's Magazine.* For many years he wrote the keen and witty book reviews in *Life* under the signature of DROCH. His work in book form has appeared as follows: *Humours of the Court, a Comedy, and Other Poems* (1893); *Overheard in Arcady* (1894); *Suppressed Chapters and Other Bookishness* (1895); *Bramble Brae* (1902), a volume of poems; *Demeter—A Mask* (1905).

BRIDGET, *bridj'ĕt*, SAINT (properly *Birgitta* or

Brigitte): famous Rom. Cath. saint, abt. 1304–1373, July 23: b. Sweden, daughter of a prince of the blood-royal. At the age of sixteen she married Ulf Gudmarson, Prince of Nericia, a stripling of eighteen, by whom she had eight children, the youngest of whom, named Catherine, 1336–81, became *par excellence* the female saint of Sweden. After having made a pilgrimage to Palestine, she died at Rome on her return. Her bones were carried to Wadstena, and she herself was canonized 1391 by Pope Boniface IX. Her festival is Oct. 8.

Not to be confounded with this Swedish saint is another St. Bridget, or St. Bride, as she is commonly called, native of Ireland, who lived in the last part of the 5th and beginning of the 6th c., and was renowned for her beauty. To escape the temptations to which this dangerous gift exposed her, as well as the offers of marriage with which she was annoyed, she prayed God to make her ugly in appearance. Her prayer was granted; and she retired from the world, founded the monastery of Kildare, and devoted herself to the education of young girls. Her day is Feb. 1.

BRIDGETON, *bridj'tun:* New Jersey, city, port of entry, and capital of Cumberland co. Located on both sides of the Cohansey river, and on the N. J. Central and the West Jersey & S. Railroads, 38 m. s. of Philadelphia. It is a very old town, having been a place of considerable importance before the Revolutionary war. The surroundings are favorable to agriculture, and it has manufactures of glass, gas-pipe, nails, machinery, flour, oil-cloth, woolen goods, shoes, shirts, etc., and there are also large fruit and vegetable canning interests. Among the educational institutions are South Jersey Institute, West Jersey Academy, Ivy Hall Seminary, Seven Gables Seminary, and a public high school. There is a good water and sewerage system, two national banks, and electric street railways and lights. Pop. (1910) 14,209.

BRIDGE'TOWN: capital of Barbadoes (q.v.): on the w. coast of the island along the n. side of Carlisle Bay, which forms its roadstead; lat. 13° 4′ n., long. 59° 37′ w. It was founded about the middle of the 17th c., taking the name Indian Bridge, and later its present appellation, from a rude aboriginal structure which spanned a neighboring creek. The present city, however, is much more recent, the former having been almost destroyed by fire 1766, May. The principal buildings include the Church of St. Michael, now the cathedral of the diocese; the Church of St. Mary; the Jewish Synagogue; the Central School; Harrison's Free School; a handsome market-place; the barracks at the south extremity of the city; and the military hospitals. Bridgetown has been at several periods much damaged by fire. In 1831 a part of Bridgetown was destroyed by a hurricane, and in 1845, it again suffered severely

from fire. It is the residence of the bishop of Barbadoes and of the gov. gen. of the Windward Islands. Except Broad street, the thoroughfares are irregular, and the shops or general stores, having no windows in front, look heavy and unattractive. There is considerable trade. Pop. 21,384.

BRIDGEWATER: a town (inc. 1656, June 3) in Plymouth co., Mass., on the Old Colony railroad; 32 m. n. by e. from Fall River. It has extensive manufactures of cotton, iron, paper, augers, etc., and a specialty in the manufacture of cotton-gins. Two important educational institutions, the Bridgewater State Normal School and the Bridgewater Academy, also a savings bank, a weekly newspaper, and the state workhouse, are in Bridgewater. This old town once formed part of Duxbury; three new townships have been separated from it, incorporated as East Bridgewater, North Bridgewater (now Brockton, q.v.), and West Bridgewater. Pop. (1900) 5,806; (1910) 7,688.

BRIDGE'WATER: town and port of Somersetshire, Eng., on both sides of the Parret (here spanned by an iron bridge), 6 m. in a direct line, and 12 by the river, from the Bristol Channel, 30 m. s.w. of Bristol. It stands on the border of a marshy plain between the Mendip and Quantock Hills, but the country around is well wooded. It is chiefly built of brick. The Parret admits vessels of 200 tons up to the town; it rises 36 ft. at spring-tides, and is subject to a bore or perpendicular advancing wave, 6 or 8 ft. high, often causing much annoyance to shipping. The river divides the town into two parts, which are connected by an elegant iron bridge of one arch. The houses are generally well built, and chiefly of red brick. Among the chief buildings are the parish church (St. Mary Magdalene's), a handsome ancient structure, with a towner and spire; St. John's Church; the town hall, a handsome building in the Venetian style; corn exchange; borough jail; market-house; and custom-house. There is a free grammar school, an infirmary, and almshouses. A considerable shipping trade is carried on, chiefly coastwise. The tonnage entered and cleared annually is usually about 180,000 tons. The imports are timber, grain, coal, tallow, wine, esparto, linseed, etc.; exports, timber, bricks, etc. The chief manufacturing industry is that of bath-bricks which are made here (and indeed nowhere else) in great quantities. Ordinary bricks are also largely made, and there are engineering establishments, breweries, tanneries, foundries, oil-mills, etc. Admiral Blake was a native of this town. It suffered severely in the civil wars, when it was besieged by Fairfax, and ultimately forced to surrender, the castle being dismantled by the conqueror. The unfortunate Duke of Monmouth was proclaimed king by the corporation of Bridgewater, before the battle of Sedgemoor, 1685, 5 m. s.e. of Bridge-

water, in which he was defeated by the royal army. Bridgewater then became the theatre of Feversham's and Jeffrey's barbarity. Up till 1870, when it was disfranchised for bribery, Bridgewater returned two members to Parliament. Pop. 15,209.

BRIDGEWATER, Francis Egerton, Duke of, styled the 'Father of British Inland Navigation': 1736–1803, Mar. 8; youngest son of Scroop, fourth Earl and first Duke of Bridgewater; succeeded his elder brother, second duke, 1748. In 1758–60, he obtained acts of parliament for making a navigable canal from Worsley to Salford, Lancashire, and carrying it over the Mersey and Irwell Navigation at Barton by an aqueduct 39 ft. above the surface of the water and 200 yards long, thus forming a communication between his coal-mines at Worsley and Manchester, on one level. In this great undertaking he was aided by the skill of James Brindley (q.v.), the celebrated engineer, and expended large sums of money. He was also a liberal promoter of the Grand Trunk Navigation: and the impulse that he thus gave to the internal navigation of England led to the extension of the canal system throughout the kingdom. In politics, though not active, Bridgewater was a friend to the Pitt administration, and a contributor to the Loyalty Loan of no less than £100,000. He died unmarried and with his death the dukedom became extinct. Before he began to realize profits from his great work, Bridgewater lived in privacy, and restricted himself to the simplest fare; and after his death his great wealth was distributed among collateral branches of his family. A monument was erected to his memory in Manchester.

BRIDGEWATER, Francis Henry Egerton, Earl of: d. 1829, Feb.; son of John Egerton, Bishop of Durham, grandnephew of the first Duke of Bridgewater; succeeded his brother as eighth earl, 1823, Oct. 1. Educated for the church, he had previously been prebendary of Durham. He died unmarried, and the title became extinct. By his last will, 1825, Feb. 25, he left £8,000, invested in the public funds, to be paid to the author of the best treatise 'On the Power, Wisdom, and Goodness of God, as manifested in the Creation,' illustrating such work by such arguments as the variety and formation of God's creatures in the animal, vegetable, and mineral kingdoms, the effect of digestion, the construction of the hand of man, and by discoveries, ancient and modern, in arts, sciences, and the whole extent of literature. The then president of the Royal Soc. of London, Davies Gilbert, to whom the selection of the author was left, with the advice of the Abp. of Canterbury, the Bp. of London, and a noble friend of the deceased earl, judiciously resolved, that instead of being given to one man for one work, the money should be allotted to eight different persons for eight separate treatises, all connected with the same primary theme (see Bridgewater

TREATISES). Bridgewater also left upward of £12,000 to the British Museum, the interest to be employed in the purchase and care of MSS. for the public use.

BRIDGEWATER TREATISES: eight celebrated works 'On the Power, Wisdom, and Goodness of God,' by eight of the most eminent authors in their respective departments, published under a bequest of the last Earl of Bridgewater (q.v.), whereby each received £1,000, with the copyright of his own treatise. They are: 1. *The Adaptation of External Nature to the Moral and Intellectual Constitution of Man*, by Thomas Chalmers, D.D. (Lond. 1833, 2 vols.). 2. *Chemistry, Meteorology, and the Function of Digestion considered with Reference to Natural Theology*, by William Prout, M.D. (Lond. 1834). 3. *On the History, Habits, and Instincts of Animals*, by the Rev. William Kirby (Lond. 1835, 2 vols.). 4. *On Geology and Mineralogy*, by the Rev. Dr. Buckland (Lond. 1837, 2 vols.). 5. *The Hand, its Mechanism and Vital Endowments, as evincing Design*, by Sir Charles Bell (Lond. 1837). 6. *The Adaptation of External Nature to the Physical Condition of Man*, by John Kidd, M.D. (Lond. 1837). 7. *Astronomy and Genernal Physics, considered with Reference to Natural Theology*, by the Rev. William Whewell (Lond. 1833). 8. *Animal and Vegetable Physiology, considered with Reference to Natural Theology*, by Peter Mark Roget, M.D. (Lond. 1840, 2 vols.). All these works have been republished by Bohn.

BRIDGE WHEATSTONE: an arrangement for measuring electrical resistances. See ELECTRICAL MEASURING INSTRUMENTS.

BRIDGMAN, FREDERICK ARTHUR, American artist: b. Tuskegee, Ala., 1847, Nov. 10. He studied at the Brooklyn Art School, and at the National Academy of Design, New York, and was a pupil of J. L. Gérôme, and at the Ecole des Beaux Arts, in Paris. In 1872 he went to Africa and began to paint subjects belonging to that part of the world, somewhat in the manner of Gérôme, but with a greater mastery in color. He has long resided in Paris, where he has exhibited his works with great success. He is noted for figure pieces and Oriental and archæological pictures. Among his paintings are: *An American Circus in Normandy; L'Arabe; Pharo;* and *Burial of a Mummy*, which was awarded a prize at the Paris Exposition of 1878. He is a member of the National Academy of Design, New York, and a Chevalier of the Legion of Honor.

BRIDGMAN, HERBERT LAWRENCE, American journalist and explorer: b. Amherst, Mass., 1844, May 30. Graduating at Amherst College in 1866, he entered journalism and became associate editor of the Brooklyn *Standard Union*. In 1894 he accompanied and wrote an account of the Peary auxiliary expedition; in 1897 he was with Prof. Libbey of Princeton when the latter

scaled the 'Enchanted Mesa' of New Mexico; in 1899 he commanded the Peary auxiliary expedition on the steamship *Diana;* and in 1901 on the steamship *Erik.*

BRIDGMAN, LAURA: b. 1829; d. 1889: a blind deaf-mute whose remarkable attainments attracted wide notice, although she falls far behind Helen Keller (q.v.) in accomplishments. She was born a normal child but lost her sight and hearing as a result of scarlet fever. Smell and taste were also deficient. By tireless perseverance on the part of her teacher, S. G. Howe, she was taught to read and write with the blind symbols by appealing to the sense of touch. She was the first person so afflicted who was ever successfully taught such accomplishments.

BRIDLE, n. *brī'dl* [AS. *bridel;* F. *bride,* a bridle—from O.H.G. *brittil,* a bridle: Icel. *bitill;* Dan. *bidsel,* a bridle —Icel. *bitill* is apparently the dim. of *bit,* the curb]: the bit and reins by which a rider is able to guide and restrain a horse; any restraint or check; a curb; a piece in the interior mechanism of a gun which holds and covers; a piece of cable fastened to a swivel on a chain to enable a moored ship to veer about; in a *plow,* a sort of swivel at the end of the beam to which the horses are attached, which enables the plowman to regulate the depth and breadth of the furrow-slice. V. to put on a bridle; to restrain; to govern; to curb; to check. BRIDLING, imp. *brīd'lĭng.* BRIDLED, pp. *brī'dld.* BRIDLER, n. *brīd'ler.* BRIDLE-PATH, a path only wide enough for a saddle-horse or a pack-horse to pass singly. —SYN. of 'bridle,' v.: to curb; control; govern; check; restrain; subdue; repress; master.

BRIDLE, v. *brī'dl,* as in BRIDLE UP [in allusion to the position and motions of a horse's head with the reins drawn tight: Gael. *brúite,* grieved, offended]: to hold up and toss the head in anger, pride, or resentment.

BRIDLINGTON, or BURLINGTON, *bĕr'lĭng-tun:* seacoast town in the East Riding of Yorkshire (including Bridlington Quay, a port and bathing-place about 1 m. to the s.e.), 6 m. w. of Flamborough Head, 40 m. e.n.e. of York. Bridlington is situated on a gentle slope in a recess of a beautiful bay. The country is hilly to the n. but subsides to the s. into a flat alluvial and fertile tract called Holderness. It has the aspect of an old town with narrow irregular streets. It has considerable trade in grain, also some soap-boiling and bone-grinding works. Bridlington is supposed to have been the site of a Roman station. The Danes had strongholds in this vicinity nearly 300 years, and many conflicts between them and the Saxons and Normans occurred here. Great numbers of ancient tumuli or barrows remain. An Augustine priory of immense wealth, and which subsisted for 400 years, was founded here by a grand-nephew of the Conqueror, and obtained may privileges from Henry I., and from King John.

Some parts of it remain. In 1643, Henrietta, queen of Charles I., landed here with arms and ammunition from Holland bought with the crown-jewels. Bridlington Quay has a chalybeate mineral spring, as well as an intermitting one of pure water. Bridlington is noted for its chalk-flint fossils. In the lacustrine deposits near Bridlington were found, some years ago, the bones of a large extinct elk, with branching horns, measuring 11 ft. from tip to tip. Pop. 13,000.

BRIDOON, n. *brĭ-dôn'*, or BRADOON, *brăd-dôn'* [F. *bridon*, a snaffle-bridle, a brake—from *bride*, a bridle—from O.H.G. *brittil*]: the snaffle and rein of a military bridle.

BRIDPORT, *brĭd'port:* town in Dorsetshire, in a vale at the confluence of the Asker and the Birt, or Brit, or Bride, 16 m. w.n.w. of Dorchester, 2 m. from the English channel. It stands on an eminence surrounded by hills, and consists chiefly of three spacious and airy streets. The chief manufactures are ropes and cordage, besides twine, shoe-thread, fishing-nets, and sail-cloth. Shipbuilding is carried on to some extent. The vicinity is celebrated for its cheese and butter. Bridport was a considerable town before the Norman Conquest, and had a mint for coining silver. On the coast near are sandy cliffs, 200 ft. high, abounding in fossils. Pop. 5,710.

BRIE, *brē:* old district of France, between the Marne and the Seine, celebrated for its grain and cheese. Meaux is its principal town. It was subdued by the Franks, and became a part of the kingdom of Neustria. It was ruled by its own counts in the 9th c. In 1361 it passed to the crown. It is now comprised in Aisne and adjoining departments.

BRIEF, a. *brēf* [F. *bref;* OF. *brief*—from L. *brĕvis*, short: Ger. *brief*, an epistle or letter: short; concise: N. an abridged writing; an epitome; concise narrative of a case, with short written instructions to counsel in conducting the case before a court of law: its preparation tests the skill of the lawyer, as it requires careful arrangement, and compression, yet with no material omission. BRIEF'LESS, a. without a brief; having no clients, as a barrister. BRIEF'LY, ad. *-lĭ.* BRIEF'NESS, n. shortness; conciseness. APOSTOLICAL or PAPAL BRIEF, a letter on public affairs, addressed by the pope to a prince, a high official, or to religious communities, written on paper or smooth parchment, sealed with red wax, and impressed with the figure of the fisherman Peter in a boat. A *bull* is a more formal document, and issued only on important occasions, written on parchment, and with a seal of lead [L. *bulla*, a boss or ornament] or green wax, impressed with the fisherman's seal.

BRIEF: a short statement or summary, particularly the summary of a client's case which the solicitor draws up for the instruction of counsel. In American practice

a brief is an abridged statement of a party's case. It should give the names of the parties to the action, their residence and occupation, and tell the character in which they sue and are sued, and wherefore they prosecute or resist the action. It should contain an abridgment of all the pleadings; a chronological and methodical statement of the facts, in language easily understood; a summary of the questions in issue, and of the evidence which is to support each of the issues; the names of the witnesses by whom the facts are to be proved, or if there be written evidence, an abstract of such evidence; a description of the personal character of the witnesses, whether morally good or bad, whether they are naturally timid or over-zealous, firm or wavering, and the like. It should contain also a summary of the evidence of the opposite party, if known, and such facts as are adapted to oppose, confute, or repel it. The object of the brief is to inform the person who tries the case of the facts important for him to know. In some of the State courts and in the supreme court of the United States it is customary or requisite to prepare briefs of cases for the perusal of the court. These are usually printed. Briefs vary according to the purposes for which they are to be used. The points in a brief intended for the court should be printed in a bold, heavy-faced letter, although subordinate matter may be put in capitals, italics, and common type, according to its importance.

BRIEF, or BREVE, PAPAL: in the corrupt Latinity of the early ages, a short letter written to one or more persons (hence the German *brief*, a letter); now used to denote certain pontifical writings, which, however, do not receive their name from the brevity of the composition, but from the smallness of the calligraphy. The papal brief differs from the papal bull (q.v.) in several points. It gives decisions on matters of inferior importance, such as discipline, dispensations, release from vows, indulgencies, etc., which do not necessarily require the deliberations of a conclave of cardinals. Still, it is not to be confounded with the *motus proprii*, or private epistle of the pope as an individual, as its contents are always official. His holiness speaks, as it were, with a kind of familiar parental authority, and the brief is consequently superscribed *papa*, while the person to whom it is addressed is addressed '*dilecte fili*' (beloved son). It is signed, not by the pope, but by the *Segretario de' Brevi*, an officer of the papal chancery, with red wax, and only with the pope's private seal, the fisherman's ring; hence it concludes *Datum Romæ sub annulo piscatoris* (Given at Rome under the ring of the fisherman). It is written on paper, or, like the bull, on parchment, with this difference, that the bull is written on the rough side, and in ancient Gothic characters, while the brief is written on the smooth side, and in modern Roman characters.

BRIEG: town of Silesia, Prussia, about 27 m. s.e. of Breslau; on the left bank of the Oder, and on the railway between Breslau and Vienna, and is surrounded with walls which have been partly converted into promenades. The streets are wide and regular, and commercially Brieg is a thriving town, its manufactures including linens, woolens, cottons, hosiery, ribbons, lace, leather, and tobacco. The battle-field of Mollwitz (q.v.) lies a little w. of Brieg. Pop. 20,154.

BRIEL, *brēl*, or BRIELLE, *bre-ĕl'*, or THE BRILL, *brĭl:* fortified seaport town, on the n. side of the island of Voorne, s. Holland; near the mouth of the Maas, about 14 m. w. of Rotterdam, in lat. 51° 54′ n., long., 4° 10′ e. Briel has a good harbor, and is intersected by several canals. The men of the place are busied chiefly as pilots and fishermen. Briel may be considered the nucleus of the Dutch republic, having been taken from the Spaniards by William de la Marck 1572. This event was the first act of open hostility to Philip II., and paved the way to the complete liberation of the country from a foreign yoke. In 1585, Briel was one of the towns made over to England as security for certain advances made to the states of Holland; it was restored to the Dutch 1616. Briel was the first town of Holland which, without extraneous aid, expelled the French in 1813. The celebrated admirals De Witt and Van Tromp were natives of this place. Pop. estimated at 5,000.

BRIENNE-LE-CHATEAU, *bre-ĕn'lĕh-shâ-to'*, or, as it is now called, BRIENNE-NAPOLEON, *bre-ĕn' nâ-po-lā-ōng':* small town in the dept. of Aube, France, on the right bank of the river Aube, about 14 m. n.w. of Bar-sur-Aube. It is celebrated as the place where Napoleon I. received his earliest military education, he having entered the school here 1779, when he was 10 years old, and remained until 1784. It is also memorable for the battle fought here between the French and the allies 1814. On Jan. 29, Bonaparte, who had collected his forces in the vicinity of Brienne-le-Chateau, with a view to check the advance of the allies on Paris, attacked Blücher, who was stationed in the town, and drove him out with considerable loss. In the struggle, the town, built chiefly of wood, was almost reduced to ashes. On the 30th, the contest was renewed, and Blücher was forced to retreat to Trannes. On the following day, Napoleon deployed his forces in the plain between La Rothière and Trannes, and on Feb. 1, the corps of the Crown-Prince of Würtemberg and Count Giulay, and the Russian reserves of grenadiers, having joined Blücher, Prince Schwarzenberg gave orders to renew the combat. After a sanguinary struggle, during which Napoleon, feeling the importance of the contest, exerted all his influence over his troops, led several charges in person, and frequently exposed himself to danger, victory at length declared decisively for the allies at every

point. During the night of Feb. 1, and the morning of the following day, the French troops retreated from Brienne. The loss on both sides in killed and wounded was about equal, nearly 5,000. The allies took 9,000 prisoners, and 70 pieces of artillery. This victory opened the way to Paris, and led to the fall of the empire.

BRIENZ, *bre'ĕnts:* town of the canton of Bern, Switzerland, beautifully situated at the foot of the Bernese Alps, on the n.e. shore of the lake of Brienz, about 30 m. e.s.e. of Bern. Its cheese is held in high repute. Pop. 3,000.

The lake of BRIENZ, about 8 m. long and 2 wide, is formed by the river Aar, at the foot of the Hasli valley, and by the same river it discharges its surplus waters into Lake Thun. The lake is 1,850 ft. above the sea; its average depth is about 500 ft. but in some places it is said to have a depth of more than 2,000 ft. It is surrounded by high mountains, the principal of which is the Rothorn, from which splendid views of the whole range of the Bernese Alps are obtained. A small steamer plies daily on the lake between Brienz and Interlaken, touching at the celebrated Giessbach Fall every trip.

BRIER, or BRIAR, n. *brī'ĕr* [AS. *brær;* F. *bruyère,* heather—from OF. *bruière*—from mid. L. *bruārĭŭm* or *brugārĭă,* barren land, a heath, heather—from Breton, *brûg*]: *originally,* a place thickly covered with heath, ferns, and thorny bushes; *now,* a prickly plant or shrub, as the *sweet-brier;* the sweet-brier is *Rōsa rubĭgĭnōsa,* and the dog-rose, producing the common hips, is *Rōsa canīna,* ord. *Rosācĕæ.* BRIERY, a. *-ĭ,* full of briers; thorny.

BRI'ERLY HILL: ecclesiastical dist. in Staffordshire, Eng., two m. n.n.e. from Stourbridge; on the Oxford Worcester and Wolverhampton railway. It is a place of much activity, the district abounding in coal, iron, and fire-clay; and there are numerous collieries, large iron-works, glass-works, brick-works, and potteries. The manufacture of steam-boilers is extensively carried on. Pop. 12,050.

BRIEUC, SAINT, *săng-bre-ĕh':* seaport town, in the dept. of Côtes-du-Nord, France; on the right bank of the Gouet, about 2 m. from its mouth in the Bay of St. Brieuc, a part of the English Channel; lat. 48° 31′ n., long. 2° 45′ w. The town is said to owe its origin to an Irishman, St. Brieuc, who built a monastery here in the 5th c. St. Brieuc has the ruins of an old tower that formerly defended the entrance to the river, but was partially blown up by order of Henri IV. 1598, and a cathedral, part of which dates from the 11th c. The ramparts were destroyed 1788, and their site has been converted into a pleasant promenade, terminating in a terrace that commands a fine view of the Channel.

St. Brieuc has manufactures of woolen stuffs, linen, cotton, leather, paper, etc.; it has also ship-building yards, and a trade in agricultural produce. Pop. about 17,000.

BRIG, n. *brĭg* [contr. of *brigantine* (see BRIGANTINE)]: a vessel with two masts, both square-rigged.

BRIG—BRIGANTINE: a brig is a square-rigged vessel with two masts. A brigantine, or hermaphrodite brig, is a two-masted vessel, with the mainmast of a schooner and the foremast of a brig. A brig's mainsail is the lowest square-sail on the mainmast, whereas the mainsail of a brigantine is a fore-and-aft sail like that of a schooner.

BRIGADE, n. *brĭ-gād'* [F. *brigade*—from It. *brigata*, a troop, a company]: a troop or set of people engaged in a common occupation, as, a fire-brigade, a life-saving brigade, etc.; a body of soldiers, whether of infantry or cavalry, consisting of several regiments, but of no fixed number: V. to form troops into brigades. BRIGA'DING, imp. BRIGA'DED, pp. said of certain battalions or regiments when placed in the same brigade. BRIGADIER, n. *brĭg'ă-dēr'*, or BRIGADIER-GENERAL, n. the officer who commands a brigade. BRIGADE-MAJOR, the staff-officer of a brigade.

BRIGADE, *brĭ-gād'*, in general, an indeterminate number of regiments or squadrons. In the British army a brigade of infantry is generally composed of three regiments; a brigade of horse, of from 8 to 12 squadrons; and one of artillery, of five guns and a howitzer. A number of brigades form a division, and several divisions an army corps. A brigade-major is the chief of the brigade-staff. A brigadier-general commands a brigade. In the United States army three regiments of infantry or cavalry usually constitute a brigade, but there may be two regiments only, or more than three. The American brigade, like the British, is commanded by a brigadier-general. The brigade combination was introduced by Gustavus Adolphus, whose example was followed by Turenne, who formed brigades of 3,000 to 4,000 men. The use of the term in the French service is somewhat equivocal. In the gendarmerie, as formerly in the cavalry, a brigade is the small fraction of an army under the command of a subaltern officer. In the regular army a brigade now contains two or three regiments of infantry or cavalry, or else a mixed body.

BRIGADIER-GENERAL: a military officer of intermediate rank between a major-general and a colonel; the officer in the army of the United States who commands a brigade.

BRIGAND, n. *brĭg'ănd* [OF. *brigand*, a light-armed foot-soldier, in F., a brigand—from It. *briga*, strife: mid. L. *brigantini*, light-armed foot-soldiers: comp. W. *brigant*, a highlander]: one of a band of robbers, usually inhabiting mountainous districts; a freebooter. BRIG'-

ANDAGE, n. *-ăn-dāj,* thefts by organized and armed bands of men; robberies, often with violence and murder.

BRIGANDINE, n. *brĭg'ăn-dĭn,* the old spelling of BRIGANTINE [F. *brigandine*]: in OE., a light kind of armor made up of many jointed and scale-like plates, sewed upon quilted linen or leather, and covered with a similar substance to hide the glittering of the metal. It formed a sort of coat or tunic. The Brigandine was named from the *Brigans,* a kind of light-armed irregular corps, somewhat like the Cossacks and Bashi-bazouks of recent days, and, like them, addicted to marauding and pilfering: see BRIGAND.

BRIGAN'TES: see BRITANNIA.

BRIGANTINE, n. *brĭg'ăn-tĭn* [It. *brigante,* a pirate; *brigandare,* to play the pirate at sea]: a light swift vessel, formerly used by pirates: see BRIG.

BRIGGS, *brĭgz,* CHARLES AUGUSTUS, D.D.: theologian: b. New York, 1841, Jan. 15. He studied in the Univ. of Virginia 1857–60; in the Union Theol. Sem., New York, 1861–63; and in the Univ. of Berlin 1866–69. In 1870, he became pastor of a Presb. church in Roselle, N. J. He was made prof. of Hebrew at Union Theological Seminary 1874; prof. of Biblical theology 1891. At his entrance on the latter professorship, he pronounced an inaugural address which called forth severe criticism and dissent from many presbyteries throughout the country. He was arraigned before the presbytery of New York, 1892, Nov. 9, charged with heretical teaching in six points. The charges were: 1. That the human reason is a fountain of divine authority, which may and does savingly enlighten men, even such as reject the Scriptures as the authoritative proclamation of the will of God, and reject also the way of salvation through the mediation and sacrifice of the Son of God as revealed therein. 2. That the church is a fountain of divine authority which, apart from the Holy Scripture, may and does savingly enlighten men. 3. That errors may have existed in the original text of Holy Scripture as it came from its authors. 4. That Moses is not the author of the Pentateuch. 5. That Isaiah is not the author of half of the book that bears his name. 6. That the sanctification of believers is not complete at death. In the final vote, Dec. 31, he was acquitted on all the charges by varying majorities. Appeal was taken to the general assembly, which, at its session at Washington, D. C., reversed the decision of the New York presbytery, and on June 1, suspended Dr. Briggs from the Presb. ministry. In 1899 he was ordained priest in the Protestant Episcopal Church, by the Bishop of New York. He is editor of the *International Theological Library,* and the *International Critical Commentary;* and among his publications are the following: *Biblical Study; American Presbyterianism; Messianic Prophecy; A Theological Question for the Times; The Authority of Holy*

Scripture; The Higher Criticism of the Hexateuch; The Bible, the Church, and the Reason; The Messiah of the Apostles; The Messiah of the Gospels; The Case of Dr. Briggs, three parts; *New Light on the Life of Jesus; Ethical Teachings of Jesus*, etc.

BRIGGS, Charles Frederick, American author and journalist: b. Nantucket, Mass., 1804; d. Brooklyn, N. Y., 1877, June 20. Throughout his life he was engaged in journalism in New York, and under the pseudonym of Harry Franco was widely known. In 1844 he founded the *Broadway Journal*, and for a time Edgar Allen Poe was his associate editor. He was connected with *Putnam's Magazine* (1853–6); the New York *Times*, the *Evening Mirror*, the Brooklyn *Union*, 1870–4, and the *Independent*. Publications: *Harry Franco; a Tale of the Great Panic* (1837); *The Haunted Merchant* (1843); *Working a Passage* (1844); *Trippings of Tom Pepper* (1847); *Seaweeds from the Shores of Nantucket* (1853); and in collaboration with Augustus Maverick, *The Story of the Telegraph, and a History of the Great Atlantic Cable* (1858).

BRIGGS, George Nixon, American politician: b. Adams, Mass., 1796, April 13; d. Pittsfield, Mass., 1861, Sept. 12. He was governor of Massachusetts 1844–51, and one of the founders in that State of the Republican party. He spent one year at an academy, studied law, was admitted to the bar in 1818, and soon established a reputation as one of the best criminal lawyers in the State. From 1831–43 he was a representative in Congress, serving through one Congress as chairman of the Post-Office Committee. During his term as governor extraordinary efforts were made to induce him to pardon Prof. Webster, the murderer of Dr. Parkham, but he refused to interpose. For 16 years he was a trustee of Williams College, and at all times a noted advocate of temperance. His death was the result of an accident received from a gun. His life has been written by W. C. Richards under the title of *Great in Goodness* (1866).

BRIGGS, Henry: 1556–1631, Jan. 26; b. Warleywood, near Halifax, Yorkshire, Eng.; mathematician. He studied at St. John's College, Cambridge. In 1596 he was appointed first reader in geometry at Gresham House (afterward College), London, and in 1619 first Savilian prof. of geometry in Oxford. This office he retained till his death at Oxford. Briggs made an important contribution to the theory of logarithms, of which he constructed invaluable tables. Napier the inventor had, 1614, published a table of the so-called natural logarithms, when Briggs observed that another system, in which the logarithm of 10 should be taken as unity, would afford great facilities of calculation. Napier admitted the improvement on his own system, and intended to assist in carrying the plan into effect;

but died 1618, when the whole work was left to Briggs. In the same year he published his *Chilias Prima Logarithmorum,* containing the first thousand natural numbers calculated to eight decimal places, and in 1624 published his *Arithmetica Logarithmica,* the fruit of many years of unwearied application, and giving the logarithms of natural numbers from 1 to 20,000, and from 90,000 to 101,000, with fifteen places. His system of logarithms is now commonly adopted.

BRIGGS, Le Baron Russell, American educator: b. Salem, Mass., 1855, Dec. 11. He was graduated from Harvard University in 1875, was assistant professor of English there, 1885–90, and professor from 1890. He was dean of the university 1891–1902; since 1902 has been dean of the faculty of Arts and Sciences; since 1904 has been Boylston professor of rhetoric and oratory and since 1903 has been president of Radcliffe College. He has written *Old Fashioned Views of Modern Education; Original Charades; School, College, and Character.*

BRIGHAM, *brĭg'ăm,* Amariah, American physician: b. New Marlborough, Mass., 1798, Dec. 26; d. Utica, N. Y., 1849, Sept. 8. He began practice at Enfield, Mass., about 1821, but soon removed to Greenfield, where he became widely known for his skill as a surgeon. In 1828 he went to Europe and spent a year studying in the hospitals. In 1831 he settled in Hartford, Conn., and in 1840 was appointed superintendent of the retreat for the insane there. Two years later he accepted a similar position at the State Lunatic Asylum, Utica, N. Y., where he remained till his death. He was a skilful business man, an able physician, and was frequently called to act as an expert in the courts. Publications: *Treatise on Epidemic Cholera* (1832); *Influence of Mental Cultivation on the Health* (1833); *Influence of Religion upon the Health and Physical Welfare of Mankind* (1835); *Inquiry Concerning the Diseases and functions of the Brain, the Spinal Cord, and Nerves* (1840); *The Asylum Souvenir* (1849); *Mental Exertion in Relation to Health* (1866). See C. E. Goodrich, *Sermon on the Death of Amariah Brigham* (1850).

BRIGHAM, Sarah J. (Lathbury), American illustrator and writer for young people: b. Manchester, N. Y., 1835, March 5. She was married to J. R. Brigham in 1854. She has written: *Under Blue Skies* (1886); *Leopold and His Wheel* (1896); *The Pleasant Land of Play* (1898); *The Bond of Honor;* etc.

BRIGHAM, William Tufts, American ethnologist: b. Boston, Mass., 1841, May 24. He was admitted to the Massachusetts bar in 1867, was for a year botanical instructor at Harvard and served for a time on the Boston school board. He removed to Honolulu in 1888, and has since been in charge of the Bishop Museum of Ethnology there. He has published: *Cast Catalogue of*

Antique Sculpture; Guatemala, the Land of the Quetzal; Volcanic Manifestations in New England; Hawaiian Feather-work; Index to the Islands of the Pacific Ocean; Stone Implements of the Ancient Hawaiians; Mats and Baskets of Hawaiians; etc.

BRIGHT, a. *brīt* [AS. *beorht;* Icel. *biartr,* bright: Goth. *bairhts,* clear, manifest; *braight,* a large blazing fire]: shining; clear; illustrious; evident; clever; indicating success, as bright hopes or prospects: N. in OE., splendor. BRIGHT'LY, ad. *-lĭ* BRIGHT'NESS, n. lustre; splendor. BRIGHTEN, v. *brīt'n,* to make clear or shining; to increase the lustre of; to cheer; to clear up. BRIGHTENING, imp. *brīt'ning.* BRIGHTENED. pp. *brīt'nd,* made bright.—SYN. of 'bright'; clear; lucid; luminous; vivid; splendid; brilliant; lustrous; shining; resplendent; effulgent; refulgent; radiant; glittering; sparkling; transparent; translucent.

BRIGHT, CHARLES, English civil engineer: b. London, 1863, Dec. 25. He is the youngest son of Sir Charles Tilston Bright, who laid the first Atlantic cable, and has been himself employed in cable-laying in many parts of the world, as well as on various surveying expeditions. He has published *Science and Engineering During the Victorian Era; Submarine Telegraphs; Underground Cables; Ancient Methods of Signalling; The Evolution of the Electric Telegraph, 1837–97; The Life of Sir Charles Bright; Imperial Free Trade; Imperial Telegraphy.*

BRIGHT, JAMES FRANCK, English historical writer; b. London, 1832, May 29. He was educated at Rugby, and University College, Oxford, and was master at Marlborough College and head of the modern department there for 16 years. Since 1874 he has been dean of University College, and honorary Fellow of Baliol from 1878. He has written *History of England to 1900; Joseph II* (1897); *Maria Theresa* (1897).

BRIGHT, JESSE D., American politician: b. Norwich, N. Y., 1812, Dec. 18; d. Baltimore, Md., 1875, May 20. He received an academic education, was admitted to the Indiana bar (1831), and became circuit judge, State senator, and lieutenant-governor. From 1845 to 1857 he was a United States Senator and president of the Senate during several sessions. Re-elected in 1857, he was expelled for alleged disloyalty, 1862, Feb. 5, the chief evidence against him being a letter addressed to 'His Excellency, Jefferson Davis, President of the Confederation of States,' recommending a friend who had an improvement in firearms to dispose of. Bright maintained that at the date of the letter, 1861, March, he had no idea that there would be war, and wrote it to get rid of the inventor. Subsequently, he settled in Kentucky, and in 1866 was elected to the State senate.

BRIGHT, JOHN: English statesman and orator: 1811, Nov. 16—1889, Mar. 27; b. Greenbank, near Rochdale, Lancashire; son of Jacob Bright, a hand-weaver, who settled at Rochdale 1802. The family had, several generations previously, embraced the tenets of the 'Quakers' or 'Friends.' Bright was educated at the Quaker school at Ackworth. 1827, Feb., he entered his father's factory, and settled down to what was intended to be the business of his life. His inborn talent for oratory found vent in public speaking on temperance and other questions as early as 1830. In 1833 he visited the continent, and in 1835 Egypt and Palestine. He took a warm interest in agitation for national education 1835, and was thus brought into contact with Cobden, beginning the warm friendship and close political alliance of many years. In 1839 he married Elizabeth, daughter of Jonathan Priestman of Newcastle-on-Tyne; but she died 1841. He came out of the gloom of this bereavement and threw himself energetically with Cobden into the agitation for the repeal of the corn laws. In 1843 he was returned to Parliament from the city of Durham. After the successful close of the campaign against the corn laws, the bill limiting to 10 the hours of factory labor was strenuously opposed by Bright on the plea of its interference with the principle of free contract; but it was carried and became a law 1847. In that year he was elected representative from Manchester, and applied himself to remedying the condition of Ireland, proposing the application of the principle of free trade to Irish land. In the same year he urged action to secure a supply of cotton from India. In 1849 he married again, his bride being Margaret E. Leatham, daughter of a Wakefield banker, by whom he had four sons and three daughters. Bright ardently opposed war, and undauntedly set his face against the popular war with Russia, into which England drifted 1854. He appealed for peace 1855 in a speech of wondrous pathos, of which the passage has become classic beginning—'The Angel of Death is abroad in the land, methinks I hear the beating of his wings.' 1857, Mar., he was defeated for re-election at Manchester, but in Aug. was chosen by the electors of Birmingham. When the civil war broke out in the United States, Bright at once took and steadfastly maintained the side of the national govt., and by his influence did much to hold the cotton-operatives firm in their noble patience under severe privation while the war lasted. 1865, Apr., Cobden died, and his long-time comrade delivered in the house a eulogy whose eloquence was heightened by emotion. Bright now entered on the long contest for electoral reform which resulted at last in the act carried by the tories granting practically household suffrage. In 1868 he became president of the board of trade in Gladstone's govt., and took part in the passage of acts disestablishing

the Irish Church, and appointing school boards throughout England. In 1870 ill health compelled his resignation; 1872 he reappeared in parliament; and 1873 he became chancellor of the duchy of Lancaster. He returned to office with Gladstone 1880; but on the inception of the war with Egypt, 1882, he resigned, and to the end of his life maintained an independent attitude, strongly disagreeing, for instance, from his old leader, on the Irish Home Rule question. At his death, he who had been deemed by conservative minds a dangerous agitator had lived to see his cause repeatedly triumph in legislation which added strength to the nation; and his departure was amid the admiring regrets of friends and opponents.

John Bright was a man of strongly knit and robust frame, with a leonine head, to which, in his old age, the mane of snowy hair added a beautiful dignity. As an orator, he will rank among the very first of the 19th c. Homely, in the best sense, in his speech, he spoke as one saturated with the English of the Bible and Shakespeare. With great directness, with a moral earnestness which never descended from its native throne, with an occasional beam of lambent humor, with a wealth of picturesque and appropriate illustration and anecdote, he was a very prophet among statesmen. He used to speak in a deliberate and placid manner, his voice exquisitely modulated throughout its great compass, and he won his way speedily to the affections of his audience, and shook at will their very heartstrings.

BRIGHT, Marshal H.: born 1834, Aug. 18, Hudson, N. Y.: journalist. After a course at the scientific school of Harvard Univ. 1852, 3 he was employed as asst. editor of the Albany *Argus*. 1861, Oct., he was appointed on Gen. Robert Anderson's staff; and later held a similar position under Gens. Sherman, Buell, Rosecrans, and George H. Thomas—attaining the rank of brevet-major. He became managing editor of the *Christian at Work*, New York, 1873; editor-in-chief 1880.

BRIGHT, *brīt*, Richard, m.d.: 1789–1858: English physician; educated at Edinburgh Univ. where his instructors of general science were Dugald Stewart, Playfair, and Leslie. After spending two years at Guy's Hospital, London, he returned to Edinburgh and graduated 1813. In 1824 he was appointed a physician at Guy's Hospital, where he made those discoveries in renal disease (Bright's Disease) by which his name has become known. He published: *Reports of Medical Cases, selected with a view to illustrate the Symptoms and Cure of Diseases, by a reference to Morbid Anatomy* (1827–31, 2 vols.); *Diseases of the Brain and Nervous System* (1831).

BRIGHTENING, in Calico Printing: operation of

rendering the colors of printed fabrics more bright or brilliant, by boiling them in solutions of soda and other materials.

BRIGHTLY, *brīt'lĭ*, Frederick Charles, American lawyer: b. Bungay, England, 1812, Aug. 26; d. Germantown, Pa., 1888, Jan. 24. He came to the United States in 1831, and was admitted to the Philadelphia bar (1839). In 1870 he retired to devote himself to legal writing and compilation, for which he had pre-eminent gifts. His private law library of 5,000 volumes was one of the best collections in America. Publications: *Law of Costs in Pennsylvania* (1847); *Reports of Cases Decided by the Judges of the Supreme Court of Pennsylvania* (1851); *Equitable Jurisdiction of the Courts of Pennsylvania* (1855); *Analytical Digest of the Laws of the United States*, 1789–1869 (1865–9); *Digest of the Decisions of the Federal Courts* (1868–73); *Bankrupt Law of the United States* (1871); *Leading Cases on the Law of Elections* (1871); *Digest of the Laws of Pennsylvania, 1700–1883* (1883); and other works.

BRIGHTNESS: see Color.

BRIGHTON, Mass.: see Boston.

BRIGHTON. *brīt'ŭn*, originally *Brighthelmstone*, England; a municipal, Parliamentary, and county borough and watering-place on the coast of Sussex, 50½ m. s. of London. It is built on a slope ascending eastward to a range of high chalk cliffs; to the w. these hills recede from the coast, and leave a long stretch of sands. The Parliamentary borough includes the sister municipal borough of Hove which has a separate mayor and corporation and the two boroughs form one continuous town extending along a sea frontage of about four miles.

Buildings, Libraries, etc.—The principal public buildings are the Pavilion, built by George IV., between 1787 and 1819 and purchased by the town from Queen Victoria for £53,000 in 1850 along with the Royal stables (now a concert room known as 'The Dome') and the riding school (now the corn exchange and exhibition building); the town hall; the Aquarium, purchased in 1901 for £30,000; the Market; and the Parochial offices, erected in 1894 at a cost of £12,000. The Public Library (60,000 vols.), Museum and Art Gallery, on the Pavilion estate, were rebuilt and enlarged in 1902 at a cost of over £50,000. The Booth Museum of British Birds, Dyke Road, contains one of the most excellent collections of British birds in the kingdom.

Churches, Schools, etc.—The churches include St. Peter's Parish Church (Gothic), St. Nicholas Church (Norman front), numerous Anglican churches, several Roman Catholic churches, and the edifices belonging to the principal nonconformist denominations. Educational institutions include the Brighton College,

Brighton Grammar School, Brighton Ladies' College (Normal School), York Place Secondary School, Municipal Art and Technical Schools and numerous elementary schools.

The charitable institutions include the Sussex County Hospital, the Royal Alexandra Hospital for sick children and Convalescent Home, Brighton and Hove Hospital for Women, Brighton, Hove and Sussex Throat and Ear Hospital, Sussex Eye Hospital, and several dispensaries.

Parks.—The largest parks are Preston (62 acres), Queen's (15 acres), Hollingbury (180 acres), Blaker Recreation Ground (4 acres) and Victoria Gardens (5½ acres).

Industries.—There are practically no manufactures but the herring and mackerel fisheries are actively pursued.

Government, History and Population.—Brighton was incorporated in 1854 and the government is vested in a mayor and corporation corsisting of 14 aldermen and 42 councillors. The city owns the electricity supply, water-works, electric tramways, baths and a sanitarium. Anciently, Brighthelmstone was a mere fishing village on a level under the cliff. It was fortified by Henry VIII., and more strongly by Elizabeth; but the sea proved more dangerous than the French, and now washes over the site of the village of those days. The inroads of the sea in 1699, 1703, and 1705, undermined many cliffs and destroyed many houses. Its further inroads are prevented by a sea-wall of great strength (60 ft. high, 23 ft. thick at the base, and 2 m. long), extending along the cliffs, built at the cost of £100,000. The writings of Dr. Russel, a celebrated physician of George II.'s time, first drew public attention to B. as an eligible watering-place, and the discovery of a chalybeate spring in the vicinity increased its popularity. The visit of the Prince of Wales 1782, and his subsequent yearly residence there finally opened the eyes of the fashionable world to its immense attractions, and B. thenceforth became the crowded resort of a health-seeking population. Its progress has been very rapid, and the town is still steadily increasing. Pop. parliamentary borough (1901) 153,386 (Brighton 123,478, Hove 29,695).

BRIGHT'S DISEASE [named after the English physician, Dr. Richard B., who first investigated its character]: a serious disease of the kidney. The term, formerly much confused in its application, is now recognized as generic, including at least three different diseases of the kidney, accordingly as the malady originates in the uriniferous tubules, in the blood-vessels and particularly in the Malpighian tufts, or in the fibrous stroma. In the first case, the disease is *Inflamatory Bright's Disease;* in the second, *Waxy*

Bright's Disease; and in the third *Cirrhotic Bright's Disease.—Inflamatory Bright's Disease* is an affection, acute or chronic, of the kidney, caused often by exposure to cold, and by scarlatinal and other blood poisons. In the early stages, there are diminution of urine, albuminuria, frequently hematura, tube-casts, and dropsy; in the latter stages, these symptoms continue, and there are secondary changes in the heart, blood-vessels, and other organs. Recovery is not infrequent in the early stages, but rare in the later, death usually occurring from dropsy or uræmia. *Waxy Bright's Disease* is a chronic affection of the kidney, caused by phthisis, syphilis, and other exhausting conditions; it consists of a waxy degeneration of the Malpighian bodies and the small arteries, passing through various stages of transformation, and characterized by a large flow of albuminous urine and absence of dropsy; often there is waxy disease of other organs, particularly the spleen, liver, and intestinal canal. Recovery is rare. Death usually results from exhaustion, uremia, or concurrence of disorders.—*Cirrhotic Bright's Disease* is caused generally by the abuse of alcohol and nitrogenous food, sometimes by the poison of gout, occasionally by lead-poisoning; habitual worry is believed also to be a cause of arteriosclerosis and its allied condition, cirrhotic B.D. The disease consists of an increase of the fibrous stroma, with thickening of the capsule and ultimate atrophy of the organ. It is characterized by a very insidious commencement, none of the symptoms of the other two forms being observable, and even the albuminuria being at first very slight or even non-existent. But later there appear enlargement of the heart, polyuria, and œdema of the lungs. The concurrence of these affections produces death. The diet during the earliest stages should be easily assimilable, and not too rich in nitrogenous elements. Milk is, as a rule, well borne. See KIDNEYS: ALBUMINURIA.

BRIGITTINES: see BRIDGET, SAINT.

BRIGNOLES *brēn-yol',* or *brēn-yōl':* town in the dept. of Var, France, beautifully situated in a fertile valley, surrounded by forest-clad hills, and watered by a stream called the Calami; about 22 m. w.s.w. of Draguignan. B., which is a very salubrious place, has manufactures of broad-cloth, silk twist, soap, leather, pottery, etc., and a trade in wines, brandy, olives, and prunes. Pop. 4,225.

BRIGNOLI, *brēn-yō'lē,* PASQUALE: 1824–84; b. Italy, noted singer. He was early instructed in music, and wrote an opera at the age of 16. He sang with great success in the principal cities of Europe, and 1855 came to America, where he soon gained great popularity. In his best days his voice was a fine tenor. He sang with Madame Patti, when she first appeared in America; and later he supported La Grange, Nilsson, and other

celebrities. Although he gained large sums of money he died poor.

BRIHUEGA, *bre-wā'gâ:* town of New Castile, Spain, 20 m. e.n.e. of Guadalajara; on the Tajuña. It was formerly surrounded by walls, of which traces remain. The remains of an old Moorish fortress now serve as a cemetery. B. has manufactures of woolens, linen, glass and leather. Here, 1710, during the war of the succession, the English general Stanhope, owing to the dilatoriness of his allies in affording him support, was defeated by the Duke de Vendôme, and compelled to surrender, with all his force, amounting to about 5,500 men. Pop. 4,140.

BRIL, *brēl*, MATTHÆUS: 1550–84; b. Antwerp: Dutch painter. Went in youth to Italy, and, under the patronage of Pope Gregory XIII., painted several frescoes in the Vatican. He was distinguished also as a historical and landscape painter.

BRIL, PAUL: 1554 (or 56)–1626; younger and more celebrated brother of Matthæus Bril: Dutch painter. He received instructions under Matthæus in Rome, and soon excelled his master. His pieces were at first conceived in the fantastic style which then prevailed; but gradually his style increased in power and beauty, until it exerted a striking influence over landscape-painting. The works of his riper age exhibit high poetical qualities, and a fine appreciation of the effects of light in the sky, which have been described as little inferior to those of his great successor, Claude Lorraine. They have a character of solemn rest and calmness, and at times even an elegiac tone of melancholy, which well accords with representations of the glories of fallen Rome. A collection of excellent landscapes by B. is found in the palace Rospigliosi in Rome, and two beautiful landscapes enrich the gallery of the Pitti Palace, Florence. Besides landscapes, Bril painted scenes from biblical history; among them, the *Tower of Babel*, now in the Berlin Museum. Other pictures by B. are found in the galleries of Munich, Vienna, and the Louvre.

BRILL, n. *brĭl* [Corn. *brilli*, little spotted fishes—from *brith*, streaked, variegated], (*Rhombus vulgaris*): fish of the same genus with turbot (q.v.), found in considerable abundance on some parts of the British coasts, and common in the markets of the larger towns; known also as the bonnet-fluke, or kite, or brett. It resembles the turbot more than any other British species of this genus, but is at once distinguished by its inferior breadth, which (excluding the fins) is only equal to half its entire length; by the want of tubercles on the upper surface; by a few of the most anterior rays of the dorsal fin being elongated beyond the membrane; and by the coloring, which is reddish sandy-brown on the upper side, variegated with darker brown and sprinkled with white pearly spots,

the under side being (as in the turbot) white. The brill is taken both in sandy bays and in deep water. Although considered very inferior to the turbot, it is yet much esteemed for the table. It seldom or never attains so great a size as the turbot, rarely exceeding 8 lbs. in weight.

BRILLIANT, a. *brĭl'yănt* [F. *brillant*, brilliant, bright—from *briller*, to shine; mid. L. *beryllārĕ*, to sparkle like a precious stone—from L. *beryl'lus*, a bright shining precious stone: It. *brillare*, to quaver with the voice]: sparkling with lustre; glittering; very splendid: N. the stone that glitters; a diamond cut flat on the face, and faceted on the sides and back, so as to refract the light and make it more glittering; see DIAMOND; name of the smallest size of printer's type made or used. A *rose diamond* is faceted on the surface, and flat on the back. BRILLIANTINE, n. *bril'yănt-ēn:* a dress fabric resembling alpaca. BRILL'IANTLY, ad. *-lĭ*, very splendidly. BRILL'IANTNESS, n. BRILL'IANCY, n. *-sĭ*, great brightness.

BRILLS, n. plu. *brĭlz* [Ger. *bille*, spectacles]: the hair on the eyelids of a horse.

BRIM, n. *brĭm* [Ger. *brame;* Lith. *bremas*, border: Icel. *barmr*, the edge; *brim*, surf: M.H.G. *brëm*, border; AS. *brym* or *brim*, the surf, the surge—*lit.*, the line which separates the land from the sea]: the edge, rim or border of any vessel or thing: V. to fill or be filled up to the edge or rim. BRIM'MING. imp.: ADJ. full to the top. BRIMMED, pp.: ADJ. filled to the brim. BRIM'LESS, a. BRIM'FUL, a. *fûl*, full to the top or edge. BRIM'MER, n. a glass full to the rim or brim.—SYN. of 'brim, n.': border; edge; margin; brink; verge; rim.

BRIM, a. *brĭm* [OF. *bramir*, to utter cries]: said of swine when in heat; same as BREME, which see.

BRIMSTONE, n. *brĭm'stōn* [AS. *bryne*, a burning, and *stone:* Icel. *brennistein*, burning stone—from *brenna*, to burn; *steinn*, a stone]: a hard brittle substance of a yellow color; commercial name for sulphur (q.v.); reduced to powder by sublimation, it is called *flowers of brimstone*. BRIM'STONY, a. *ĭ*, containing brimstone.

BRINDED, a. *brĭn'dĕd*, or BRINDLED, a. *brĭn'dld* [Icel. *brondottr*, cross-barred in color—from *brandr*, a post or bar, a brand: It. *brano*, a bit: F. *brin*, a blade of grass]: streaked; spotted; colored in stripes.

BRINDISI, *brēn'dē-sē* (ancient *Brundisium*, or *Brundusium*): seaport town of s. Italy, province of Lecce; on a small promontory in a bay of the Adriatic Sea, about 45 m. e.n.e. of Taranto. Brindisi is a city of very great antiquity. It was taken from the Sallentines by the Romans, B.C. 267, who some 20 years later established a colony here. The town, partly owing to the fertility of the country, but chiefly on account of

its excellent port—consisting of an inner and outer harbor, the former perfectly landlocked, and capable of containing the largest fleets, and of easy defense on acccount of its narrow entrance, and the latter also very well sheltered—rapidly increased in wealth and importance. It soon became the principal naval station of the Romans in the Adriatic. Brindisi was the starting-place, B.C. 230, of the Roman troops that took part in the first Illyrian war; and from this point the Romans nearly always directed subsequent wars with Macedonia, Greece, and Asia. And when the Roman power had been firmly established beyond the Adriatic, Brindisi became a city second to none of s. Italy in commercial importance. Horace, who accompanied Antony in a hostile movement on Brindisi, B.C. 41, has made the journey the subject of one of his satires (*Sat. i.* 5). Virgil died here, B.C. 19, on his return from Greece. The city appears to have retained its importance until the fall of the empire, but it suffered greatly in the wars which followed. When the Normans became possessed of it in the 11th c., the Crusaders made it their chief point for embarkation for the Holy Land; but with the decline of the crusades, B. sank into comparative insignificance as a naval station. The city subsequently suffered greatly from wars and earthquakes. The principal buildings are the cathedral, where Emperor Frederick II. was married to Yolanda 1225; and the castle, commenced by Frederick II., and finished by Charles V. The district around Brindisi is still remarkable for fertility, olive oil being produced in large quantities. Some years ago, Brindisi was constituted an entrepôt for foreign goods. Since the establishment of the overland route to India, Brindisi has greatly increased, being the most convenient point of departure for the east from northern and central Europe. The extensive and well-sheltered harbor has undergone great improvement, and a substantial bulwark has been built across the n. arm to prevent it from being filled with sand. From 700 to 1,000 vessels annually enter the port. Pop. about 18,000.

BRINDLEY, *brĭnd'lĭ*, JAMES: 1716–72; b. Thornsett, near Chapel-en-le-Firth, Derbyshire, Eng.: mechanic and engineer. Apprenticed at 17 to a millwright, he afterward became an engineer, and in 1752 showed great ingenuity in contriving a water-engine for draining a coal-mine. A silk-mill on a new plan, and several others of his works, recommended him to the Duke of Bridgewater (q.v.), who employed him to execute the canal between Worsley and Manchester. Thenceforth he devoted his great skill to the construction of navigable canals; commenced the Grand Trunk, and completed the Birmingham, Chesterfield, and others. Once, when under examination before a committee of the house of commons, being jocularly asked for what

purpose he supposed rivers to have been created, he is said to have replied: 'Undoubtedly to feed navigable canals.'

BRINE, n. *brīn* [AS. *bryne*, saltness: Dut. *brijn*, pickle; Icel. *brim*, the surge on the seashore]: water of the ocean; water mixed with a large quantity of salt (see SALT): V. to steep among salt and water. BRI'NING, imp. BRINED, pp. *brīnd*. BRINY, a. *brī'nĭ*, pertaining to the sea or to brine. BRI'NISH, a. *-nĭsh*, salt. BRI'NISHNESS, n. BRINE-PUMP, a pump for changing the water in steam boilers, so as to prevent an excess of saturation of salt.

BRINE-SHRIMP (*Artemia salina*): a small crustacean, of the order *Branchiopoda* (q.v.), which, unlike the greater number of animals of that order, is an inhabitant not of fresh but of salt water, and is indeed remarkable, because it is to be found in myriads swimming about in the brine of salt-pans previous to boiling, when, having been concentrated by exposure to sun and air for about a fortnight, it destroys the life of almost all other marine animals. The full-grown brine-shrimp is about half an inch long. The little animal is almost transparent and is extremely active and graceful in its movements. The workmen at salt-pans so confidently ascribe to it the rapid clearing of the brine in which it occurs, that when it does not appear in their *salterns*, they transport a few from other salterns. They multiply with extraordinary rapidity.

BRING, v. *brĭng* [AS. *bringan;* Dut. *brengen*, to bring: Sks. *bhri*, to bear]: to fetch; to bear; to convey; to produce; to cause to come. BRING'ING, imp. BROUGHT, pt. pp. *brawt*. BRING'ER, n. one who. To BRING BACK, to recall. To BRING ABOUT, to effect or accomplish. To BRING DOWN, to depress or humiliate. To BRING FORTH, to give birth to; to produce, as fruit. To BRING FORWARD, to produce to view. To BRING OUT, to expose; to develop. To BRING IN, to import; to introduce. To BRING ON, to cause to begin; to produce. To BRING UNDER, to reduce to subjection; to subdue. To BRING UP, to nurse; to educate; to cause to come up. To BRING TO, to check or arrest the progress of a ship while sailing; to resuscitate. To BRING TO LIGHT, to make clear; to discover. To BRING TO MIND, to recall to memory. To BRING OFF, to clear; to procure to be acquitted. To BRING OVER, to convert; to draw to a new party. To BRING TO PASS, to effect.—SYN. of 'bring': to carry; fetch; bear; convey; transport.

BRINJAREE DOG, *brĭn'ja-rē:* rough-haired or long-haired variety of greyhound (q.v.) used in the Deccan, and said to be the best of the hunting-dogs of India. It is said to be superior in size and strength to the Persian greyhound, but not to be equal to the British

greyhound in swiftness. It is generally of a yellowish or tan color.

BRINK, n. *bringk* [Dan. and Sw. *brink*, declivity: Icel. *bringr*, a grassy slope, hillock: W. *bryn*, a hill]: the edge or margin of a steep place, proximity to danger.

BRIN'TON, *brĭn'tŭn*, DANIEL GARRISON, American surgeon, archæologist and ethnologist: b. Thornbury, Pa., 1837, May 13; d. Atlantic City, N. J., 1899, July 31. During the Civil War he was a surgeon in the Union army, and from 1867 to 1887 was editor of the *Medical and Surgical Reporter*. In 1884 he was appointed professor of ethnology at the Academy of Natural Sciences in Philadelphia; and, in 1886, professor of American linguistics and archæology in the University of Pennsylvania. Among his many works are notes on the *Floridian Peninsula* (1859); *The Myths of the New World* (1868); *American Hero Myths* (1882); *Aboriginal American Anthology; Primer of Mayan Hieroglyphics* (1896); *Religions of Primitive Peoples* (1897); etc. He edited *The Library of Aboriginal American Literature* in eight volumes (1882–5), and was a high authority on all American archæological topics.

BRINTON, JOHN HILL, American surgeon: b. Philadelphia, 1832. He graduated at the University of Pennsylvania (1850), and at the Jefferson Medical College (1852), serving through the Civil War as a surgeon. In 1882 he was appointed professor of the practice of surgery and clinical surgery at Jefferson Medical College. He has written *Consolidated Statement of Gunshot Wounds* (1863); with J. H. Porter, *History of the Organization of the Medical Department of the United States Army* (1864), a MS. in the surgeon-general's library at Washington; *Description of a Valve at the Termination of the Right Spermatic Vein in the Vena Cava* (1856); *Operative Surgery in General* (1881); *The March of Surgery* (1882).

BRINVILLIERS, *brăng-ve-yā*, MARIE MARGUERITE, Marquise DE, notorious as a poisoner in the time of Louis XIV.: daughter of Dreux d'Aubray, Lieutenant of Paris; received a careful education; and in 1651, while still young was married to the Marquis de Brinvilliers. This nobleman seems to have been a gay and careless spendthrift, who allowed his wife to do as she pleased. He even introduced to her a young officer named Jean Baptiste de Gaudin, Seigneur de St. Croix, who was exceedingly handsome, and who inspired her with a violent passion. Her easy husband, however, was wholly indifferent to his wife's conduct; but her father, who seems to have had a stricter sense of duty, caused St. Croix to be arrested and imprisoned in the Bastile. It was here the latter learned from an Italian the art of preparing poisons, and on his release he imparted his fatal knowledge to his mistress, who,

during his imprisonment had affected the greatest piety, spending most of her time in visiting the hospitals and in attending the sick. The marchioness now resolved to destroy her father. St. Croix eagerly abetted her, in the hope of obtaining a portion of the paternal inheritance; but in order to test the efficacy of the poison, she tried its effects upon the invalids of the *Hôtel Dieu*. Having satisfied herself, she commenced operations on her parent, kissing and poisoning him continually for eight months, until her diabolical patience was exhausted, and she was at last induced to administer a very violent dose. He died, and no one suspected the marchioness. With St Croix's assistance, and that of a domestic servant, Jean Amelin, *alias* Chaussée, she next poisoned, with the same fearful indifference to crime, her two brothers and her sisters; her object being to find means of supporting her extravagant style of living with her paramour. Several times she attempted to poison the marquis, her husband; but he escaped, and, as was said, by means of antidotes given by St. Croix, who dreaded that he should be compelled to marry the widow. St. Croix died suddenly 1672—his glass mask having fallen off while he was engaged in preparing a poison—leaving documents inculpating the marchioness. She was also accused about the same time by her accomplice Chaussée, who, being arrested, confessed all, and was condemned to be broken alive. The marchioness escaped to England; afterward she went to Germany, and next to Liege, where she took refuge in a convent. From this, however, she was craftily decoyed by an officer of justice disguised as an abbé, and conveyed to Paris. Among her papers was found a general confession of her crimes, including the above-mentioned murders, and many others. One strange confession stated that, out of pity for a virtuous young lady who had been imprisoned in a convent, the marchioness had poisoned a whole family! It is a singular fact, that this infamous woman was a bigot in her religious tenets, and was quite exemplary in her attendance at church. At her trial in Paris, she at first denied all charges brought against her, and pretended that the 'general confession' had been written during the insanity caused by a fever; but after being put to the torture, she made a full confession, and was beheaded, 1676, July. Her career had excited such terror in France, that Louis XIV. instituted a distinct tribunal, the *Chambre Ardente* (q.v.) to investigate cases of poisoning by the 'succession powder' used by the marchioness.

BRION, Luis, *loo-ēs' bre-ōn'*, Colombian admiral: b. Curaçao, 1782, July 6; d. 1821, Sept. 20. He was sent at an early age to Holland to receive his education, his father being a native of that country, and there entered the Dutch army. He was offered a commission

in 1799, but being recalled by his parents, returned to Curaçao. Receiving permission from his parents, he visited the United States, where he studied navigation. Upon the death of his father, who bequeathed him a large fortune, he bought a vessel and made several voyages; entering into speculation on his own account, he was very successful, and returned to Curaçao in 1804, where he established a mercantile house. The political events in Venezuela of 1808–10 brought Brion rapidly into notice; he volunteered his services to the republic of Caracas, and in 1811 was appointed captain of a frigate. He now devoted all his resources and his energies to the patriotic cause. At his own expense he fitted out a fleet of vessels, and attacked the Spanish forces at the island of Marguerite, where he gained a signal victory. Brion distinguished himself at the conquest of Guiana, and also at Santa Marta and Cartagena. During a residence at Savanilla he reduced the custom house duties; this coming to the ear of Bolivar, he directly countermanded the order, which so preyed upon the mind of Brion, that he became ill, and leaving the squadron returned to Curaçao, and soon died in poverty.

BRIOUDE, *brē-ôd':* town of France, in the n.w. of the dept. of Haute-Loire, capital of the arrondissement of the same name, situated near the left bank of the river Allier, on the site of the ancient town of Brivas. The old bridge at La Vieille Brioude, long celebrated as being the widest in span of any known, fell down in 1822. In the 16th c., many of the inhabitants of Brioude rose in favor of Lutheranism, but were afterward subdued by the Roman Catholic party. To Americans the town is of interest as the birthplace of Lafayette. A considerable traffic in grain, hemp, and wine is carried on here. Pop. 4,928.

BRISBANE, *brĭz'bān:* cap. of Queensland, seaport, and chief seat of trade in the state; abt. 640 m. n. of Sydney; about 25 m. from the mouth of the B. river, which falls into Moreton Bay. Of the four parts into which the town is divided, North Brisbane is situated in the heart of the city, on the north bank of the river, and South Brisbane faces it on the south. Fortitude Valley is a large division on the north bank, to the east and northeast of North Brisbane, mostly situated on a peninsula formed by the winding of the river. The fourth division, Kangaroo Point, is on the south bank, comprising a point of land projecting between North Brisbane and the above peninsula. The streets are laid out as regularly as the tortuous course of the river will permit. The chief buildings are situated in North Brisbane, among them being Parliament House, where the legislature sits; Government House, in the Botanic Gardens; the government offices; the supreme court; the post-office; the technical college; the treasury

buildings, a large structure of great architectural beauty; the old and the new town-hall; and the customs-house. Many of the banks have fine edifices, particularly the Queensland National Bank. The chief educational institutions are the Normal School, the boys' and girls' grammar schools, and the school of the Christian Brothers. Other buildings and institutions are the masonic and temperance halls; the School of Arts, with a good library; the museum; the Queensland Club; the large general hospital, and several special hospitals; an orphanage and a large jail in South Brisbane; the Opera House, one of the best theatres in Australia. The Victoria Bridge connects South with North Brisbane. It cost upward of $555,000, and replaces an older one destroyed by a flood in 1893. It consists of six steel spans supported on five cast-iron cylinders filled with concrete, the abutments being of masonry and concrete; and the total length is about 1,041 ft. Much of the cross-river traffic is carried on by the ferries. The leading parks and gardens are the Botanic Gardens, with the Queen's Park, in North Brisbane, at the river-side, finely laid out; Victoria Park, to the north of North Brisbane; Albert Park, Mount Coot-tha, Bowen Park, and the gardens of the Acclimatization Society in Fortitude Valley; and Musgrave, Dutton, and Woolloongabba parks in South Brisbane. There is extensive wharf accommodation, and South Brisbane has a dry-dock. There is regular steamer connection with Sydney, London, and elsewhere, and adequate railway communication with Sydney and other chief towns in Australia. The climate is dry and healthy, but the temperature is often very high during the summer. Among the industrial establishments are a sugar-refinery, tobacco factories, flour-mills, etc. The trade is important, among the exports being gold, wool, sugar, etc. Originally founded as a penal settlement in 1825, Brisbane was incorporated in 1859. A United States consul is stationed here. Pop. 100,913.

BRISBANE, General Sir Thomas Makdougal: 1773, July 23—1860, Jan. 27; b. at Brisbane, the family seat, near Largs, Ayrshire, Scot.: soldier and astronomer. At the age of 16 he entered the army; and with a company which he raised in Glasgow 1793, B. took part in all the engagements of the campaign in Flanders, and in the West Indies, to which he was sent 1796, he greatly distinguished himself under Sir Ralph Abercromby. He afterward served in the West Indies as col. of the 69th; and in 1812 obtained command of a brigade under the Duke of Wellington in Spain. For his conspicuous bravery at the battle of the Nive he received the thanks of parliament. When Napoleon abdicated, Brisbane was sent in command of a brigade to N. America, from whence he was recalled 1815, but too late to admit of his being present at Waterloo. In

1821, Brisbane, on the recommendation of his friend the duke, was appointed gov. of New South Wales, a position he held for four years, introducing many wise reforms, especially in penal treatment. He secured at his own expense good breeds of horses for the colony; promoted the cultivation of the sugar-cane, vine, tobacco, and cotton; and left at the close of his administration—which was marked by perfect tolerance and protection of all classes of Christians—50,000 acres of cleared land where he had found only 25,000. But high as Brisbane ranks as a soldier and administrator, as a man of science he holds a still higher place. While in Australia, he catalogued no less than 7,385 stars, for which great work—known as 'the Brisbane Catalogue of Stars'—he received the Copley medal from the Royal Soc. On his return to Scotland, he had an astronomical observatory established at his residence at Makerstoun, and applied himself entirely to scientific pursuits. He entered warmly into the plans of the British Assoc. for ascertaining the laws of the earth's magnetism, and in 1841 had a splendid magnetic observatory erected at Makerstoun, the observations made there filling three large volumes.

BRISK, a. *brĭsk* [F. *brusque*, quick, rude—from It. *brusco*, eager: W. *brys*, haste: Gael. *briosg*, lively]: active; nimble; full of life and spirit; lively; sparkling. BRISK'LY, ad. *-lĭ*, in a brisk manner; vigorously. BRISK'NESS, n. the state of being brisk; liveliness; To BRISK UP, to enliven; to appear with life and spirit, as to 'brisk one's self up.' BRISK'ING UP, imp BRISKED UP, pp. *brĭskt*.—SYN. of 'brisk'; alert; active; nimble; quick; prompt; sprightly; lively; agile; gay; vivacious.

BRISKET, n. *brĭs'kĕt* [OF. *brichet* and *brischet*, the breast of an animal: Icel. *briosk;* Sw. *brusk*, gristle: Gael. *brisg*, brittle; *brisgeac*, cartilage]: that part of the breast of an animal that lies next the ribs.

BRISSON, BARNABÉ, *bar-na-bā brē-sôn*, French jurist: b. 1531; d. 1591, Nov. 15. Henry III. commissioned him to collect and edit the ordinances of his predecessors and his own, which appeared under the title, *Code de Henri III.* In 1589 he was made first president of the parliament, and after Henri's death, in August of the same year, proclaimed the Duke de Mayenne, the Chief of the League, lieutenant-general of the kingdom. Brisson soon after became suspected by the faction of the 'Sixteen,' who ruled in Paris, and who thought that he was favorable to Henri IV. He was accordingly arrested and summarily hanged. Among his works of importance are: *De Verborum Quæ ad Jus Pertinent Significatione, etc.* (1557); *Observationum Divini et Humani Juris Liber* (1564); *De Formalis et Solemnibus Populi Romani Verbis, etc.* (1583), still in use; *Opera Minora* (1606).

BRISSON, Eugène Henri, *e-zhān ŏn-rē*, French politician and journalist: b. Bourges, 1835, July 31. He entered the chamber of deputies in 1871, and won much attention by urging amnesty for the Communists and other political offenders. Since then he has been one of the foremost members of the Radical party. He was elected president of the chamber in 1881, and retained that office until the overthrow of the Ferry ministry, in 1885, when he accepted the premiership. He was re-elected to the presidency of the chamber in 1894, and, in 1895, he retired from the ministry and was a conspicuous candidate for the presidency of France. In 1898 he again accepted the premiership, but his cabinet was soon overthrown on the army question.

BRISSON, Mathurin Jacques, *ma-too-răn zhâk*, French savant: b. Fontenay-le-Comte, 1723, April 30; d. Versailles, 1806, June 23. He was instructor to the children of the royal family of France in physics and natural history. He was also censor royal, member of the Academy of Sciences, and of the Institute, and succeeded Nollet in the chair of natural philosophy at the College of Navarre. He translated Priestley's work on *Electricity*, although he opposed his theories, and still more those of Franklin. The most able of his writings are on specific gravity and on ornithology. Buffon quotes frequently from Brisson's *Ornithologia* (1760). He published in 1800 a *Dictionnaire raisonné de physique.*

BRISSOT DE WARVILLE, Félix Saturnin, *fā-lēks sâ-toor-năn brē-sō de vâr-vēl*, French animal painter: b. Sens, 1818. His paintings are renowned for their truthful representations of nature, their scenes being laid chiefly in Touraine and Normandy, or in the forests of Fontainebleau and Compiègne. Among them are: *The Thicket* (1881); *Return of the Flock* (1885); *A Corner of the Sheepfold* (1888).

BRISSOT, *bre-sō'*, Jean Pierre: 1754—1793, Oct. 30; b. Chartres, Fr.: one of the first movers in the French Revolution, and afterward numbered among its victims. He was educated for the bar, completed his studies at Paris, and went into the office of a procurator, but quickly turned to authorship. From his earliest years he had devoted himself with passionate eagerness to literary studies, especially history, economy, and politics, and, with other lingual accomplishments, acquired a thorough mastery of English. His first work, *Théorie des Lois Criminelles* (1780), gained the approbation of Voltaire and D'Alembert, and was followed by his *Bibliothèque des Lois Criminelles*, which establihsed his reputation as a jurist. Having removed to London, he there started a learned journal, under the title *Lyceum*, for which, however, he found no adequate support. He therefore returned to Paris, and soon afterward was imprisoned in the Bastile, on a

charge of having written against the queen a brochure, which in fact was penned by the Marquis de Pelleport. After four months in the Bastile he was liberated through the intervention of Madame de Genlis and the Duke of Orleans. Brissot continued to write tracts on finance, etc., but his love of freedom and vehement hatred of despotism again involved him in danger, and, to escape from a *lettre-de-cachet*, he once more retired to England. He afterward visited N. America, as representative of the *Société des Amis des Noirs*. On his return to France, he zealously assisted in the outbreak of the Revolution, and was elected by the citizens of Paris their representative in the constitutent assembly, where he had predominant influence over all the early movements of the Revolution. He also established a journal, called *Le Patriote Français*, which became the recognized organ of the earliest republicans; and, through his superior knowledge of politics and the usages of constitutional countries he gathered round him the young men of talent and spirit who were opposed to the court-theory of absolute sovereignty. It thus happened that, without his being formally considered the head of a party, all the movements of the early revolutionists were profoundly influenced by him and he incurred the bitter hatred of the court reactionists, who affixed the nickname of Brissotins to all the advocates of reform. Afterward, the Brissotins formed the Girondist party. In the Convention, Brissot was representative of the dept. of Eure-et-Loir. Here his moderation made him suspected as a friend of royalty, as he opposed the 'men of September' and the trial and condemnation of the king. When Louis XVI. heard his doom pronounced, he exclaimed 'I believe that Brissot would have saved me!' But Brissot was weak enough to imagine that the best way to save the king would be to vote first for his death, and then appeal to the nation to spare his life. Brissot and his party, perhaps the purest in principle and the weakest in action, ultimately fell before the fierce accusations of the Mountain, or Jacobin party, which believed, or pretended to believe, that the virtuous Brissot had received money from the court to employ against the Revolution. With 20 other Girondists, Brissot suffered death under the guillotine.

BRISTED, *bris'tĕd*, Charles Astor, American author: b. New York, 1820; d. Washington, D. C., 1874, Jan. 15. He was the son of the Rev. John Bristed, and grandson of John Jacob Astor, founder of the Astor Library. He graduated with high honors at Yale in 1839, and then spent five years at Trinity College, Cambridge, England, where he took a number of prizes and became a foundation scholar. He traveled extensively, and contributed many papers on light social topics and ephemeral subjects to the magazines

of England and America. His wide culture and exact scholarship made his work attractive to all cultivated readers. He wrote *Selections from Catullus* (1849); *Letter to Horace Mann* (1850), a reply to certain attacks on Stephen Girard and J. J. Astor; *The Upper Ten Thousand* (1852); *Five Years in an English University* (1852), his most important book; *Pieces of a Broken-Down Critic* (1858); *Letter to Dr. Henry Halford Jones (that is, Dr. J. G. Holland), editor of the Wintertown Democrat (that is, Springfield Republican), concerning his habit of giving Advice to Everybody and His Qualifications for the Task* (1864); *The Interference Theory of Government* (1867). Most of his work was published under the pseudonym of CARL BENSON.

BRISTLE, n. *brĭs'sl* [AS. *bristl*, a bristle—from *byrst*, a bristle: Sw. *borst;* Icel. *burst;* Dut. *borstel;* Scot. *birse*, a thick elastic hair: Swiss, *borzen*, to stand out]: the stiff hair on the backs of swine, particularly wild boars; any stiff hair: V. to stand erect as bristles; to strut about with head erect in anger or defiance. BRISTLING, imp. *brĭs'lĭng:* ADJ. showing like bristles. BRISTLED, pp. *brĭs'sld*, rough and stiff like bristles. BRISTLY, a. *brĭs'li*, thick set with bristles; rough.

BRIS'TLES: strong hairs growing on the back of the hog and wild-boar, extensively used in the manufacture of brushes, and also by shoemakers and saddlers. They form an article of export from Russia and Germany; also from France and Belgium, and in small quantities recently from China. The quality of bristles depends on the length, stiffness, color, and straightness—white being the most valuable. The best bristles are produced by pigs that inhabit cold countries. The Russian hog is a long spare animal, and the thinner the hog, the longer and stiffer the bristles. When the Russian hog is sent to the south and fattened, the bristles become soft, and of course depreciate in value. In the summer the hogs are driven in herds through the forests, to feed on soft roots, etc., when they shed their bristles by rubbing themselves against the trees. The bristles are then collected, sewed up in horse or ox hides, and sent to fairs, whence they find their way, through agents, to all countries.

BRISTLE-TAILS, wingless insects of the order *Thysanura*. These agile creatures, which are revealed by turning over stones and sticks in damp situations, and are often seen about houses, have a long flattened body, with metallic scales, in form somewhat like those of butterflies. The antennæ are very long, setiform, many-jointed; the mouth-parts are free, with long palpi; the maxillary palpi being seven-jointed and the labial palpi four-jointed. The mandibles are stout, sunken in the head, and armed with teeth for gnawing. The prothorax is very large, and all the rings of the body are of much the same size, so that the insect bears a general

resemblance to the myriapods. The anal stylets are long and large, which, with the smaller ones inserted on the subterminal rings of the abdomen, aid greatly in locomotion, though these insects run with great rapidity and do not leap, like the *Poduridæ*, and thus remind us, as well as in their general appearance, of certain wingless cockroaches. Like cockroaches in one of its habits also is *Thermobia domestica*, which abounds in the chinks and crannies of the rouges of houses, and comes out at night, shunning the light. This species loves hot and dry localities, in distinction from the others, which seek moisture as well as darkness. By some they are called 'silver witches.' The 'silver witch' (*Lepisma saccharina*), is not uncommon in old, damp houses, where it has the habits of the cockroach, eating cloths, tapestry, silken trimmings of furniture, and doing occasional damage to libraries by devouring the paste, and eating holes in the leaves and covers of books. In general form, *Lepisma* may be compared to the larva of *Perla*, a net-veined neuropterous insect, and also to the narrow-bodied species of cockroaches, minus the wings. The body is long and narrow, covered with rather coarse scales, and ends in three many-jointed anal stylets, or bristles, which closely resemble the many-jointed antennæ, which are remarkably long and slender. They undergo no metamorphosis, the young being of the same shape as the adults. Consult: Packard, *Our Common Insects* (1873); Sharp, *Insects* (1899); also the monographs of Grassi, Oudemans, Sylvestri, etc.

BRISTOL, *brĭs'tŭl:* town in Hartford co., Conn., 18 m. w.s.w. of Hartford by the New York and New England railroad. It is a considerable manufacturing centre, with several foundries, machine shops, manufactories of brass goods, table ware, tools, bells, woolen and knit goods, etc., but its chief industry is the manufacture of clocks, which has been carried on in the town of Bristol since early in the century, the eight-day brass clock invented by the Ives Bros. having been first manufactured in B. 1832, at which time it was the most important clock manufacturing town in New England. B. has a public library, national and savings banks, and electric light and street railroad plants. Pop. (1900) 6,268; (1910) 13,502.

BRISTOL: city in Bucks co., Penn.: on the Delaware river, 23 m. above Philadelphia, 10 m. s.w. of Trenton by the Penn. railroad, nearly opposite Burlington, N. J.; having almost hourly communication with Philadelphia by steamboats. It is pleasant and neatly built, and has a bank, high school, electric light and street railroad plants, and manufactories of hosiery, carpets and foundry products. It is in the centre of a rich fruit and truck farming district and enjoys considerable trade, the Pennsylvania canal passing through the city.

One of its attractions is a valuable mineral spring. Pop. (1910) 9,256.

BRISTOL, R. I.: town, port of entry, and capital of B. co.; situated on Narragansett Bay and the N. Y. & N. H. R. R., 15 m. s.e. of Providence. It has an excellent harbor, and is the seat of the widely known Herreshoff shipbuilding works, and of the Saunders & West Yacht-building yards. It has a handsome library building containing more than 15,000 volumes, 8 churches, 17 public schools, large market gardening and coast trade interests, and manufactories of rubber, woolen and cotton goods. One of its principal features is Mount Hope, a beautiful eminence rising 300 ft. above tide-water, and interesting historically as the residence of King Philip, who was killed here in 1676. The town was bombarded by the British during the Revolutionary war, and a considerable portion of it burned. Owing to its pleasant location, as well as its historical associations, it is a popular summer resort. Pop. (1900) 6,901; (1910 est.) 7,000.

BRISTOL: Tenn. and Va. (post-office, Bristol, Tenn. or Va.), a city in Sullivan co., Tenn., and Washington co., Va., adjoin and to all intents and purposes are one place, the centre of State street being the boundary line between the two States, running due east and west. Bristol is the centre of several railroads and is contiguous to the great coal, iron, and timber regions of Southwest Virginia, East Tennessee, Western North Carolina, and Eastern Kentucky, and is the seat of King College (Presbyterian), for males; Sullins College (Southern Methodist), and Virginia Institute (Baptist), for girls; Bristol Normal College for colored people (Presbyterian), and six public schools, three on each side of the town, four white and two colored. Bristol is principally engaged in the manufacture of furniture, leather, flour, lumber, iron, staves, wood pulp, barytes, bark extract, and patent medicines, with a number of smaller industries. Bristol is situated in a beautiful valley surrounded by lofty mountains, is 1,760 ft. above the sea level, and is the headquarters for two railroads, V. I. C. & C. Co., three daily newspapers, thirteen wholesale houses, and has a Govt. building. The present city charter provides for two city councils, one for each State, and a mayor, elected biennially. Pop. (1900) 9,850; (1910) 7,148.

BRISTOL: important maritime city in the w. of England; long. 2° 35′ 28″ w., lat. 51° 27′ 6″ n.; upon the rivers Frome and Avon, and partly in the counties of Gloucester and Somerset, joined with the former for ecclesiastical and military purposes, but otherwise a city and county in itself. It is 118 m. from London by road; area by the Boundaries Extension Bill of 1904, 17,004 acres. The ancient portion of B. consists almost entirely of shops, warehouses, offices, manufactories,

and other commercial buildings. The streets are, with few exceptions, narrow and irregular; but great improvements have been effected in them recently at a cost of half a million sterling, and there are many handsome shops, and other buildings of superior character; among the latter, the banking-house of the West of England Company, the Assize Court and Guild Hall, Bank of England, General Hospital, Colston Hall, and Victoria Rooms. A great central terminus has been erected for the various railways. The most remarkable modern structure, however, is the suspension bridge over the Avon, at Clifton, which is 702 ft. in span, and 245 ft. above high water. Among the ancient buildings are the church of St. Mary Redcliffe, the Cathedral, and Temple Church, remarkable for its leaning tower. Some remains are seen of the ancient castle and walls, traces of British encampments at Clifton and Leigh, and considerable Druidic vestiges at Stanton Drew. The modern portions of Bristol, including Clifton, Cotham, Redland, etc., consist of handsome residences, in squares, terraces, crescents, and detached villas, and some creditable specimens of architecture in churches, chapels, etc.

Industries.—The principal manufacturing industries are glass works, potteries, soap works, tanneries, tobacco factories, chocolate factories, chemical works, and shipbuilding and machinery yards. Coal is found in the vicinity. The export and import trade is extensive. The dock system comprises 19 acres at Avonmouth, 12 acres at Portishead, a floating harbor of 70 acres in the heart of the city, and the Royal Edward Dock of 30 acres at Avonmouth opened in 1907.

Education.—Educational institutions include University College with its Medical School, the Grammar School, Cathedral School, the City School, or Queen Elizabeth's Hospital for Boys, Red Maids School for Girls, Clifton College, Merchant Venturers' Technical College, The Clifton and Redland high schools for girls, Clergy Daughter's School, 45 council schools, including 3 high grade and science schools, a Day Industrial School, a School for Cookery, Truant School, a Congregational College at Cotham and an Institution for the Deaf and Dumb.

Libraries, Museums, Etc.—The Bristol Central Library was completed in 1906. The existing City Library was founded in 1613. The public library system has 8 branches and circulates about 650,000 volumes per year. The Bristol Art Gallery, adjoining the Museum, was opened in 1905, February. The Museum became the property of the city in 1893.

Churches, Charitable Institutions, Etc.—The principal chruches are the Cathedral (1142), the parish church St. Mary Redcliffe (1200–93), Temple Church, St. Stephen's, All-Saints', St. Mary-le-Port, St. Philip's, St. James', and St. John's. There are also the edifices of the Independents, Baptists, Wesleyans, and Roman

Catholics; and altogether there are between 200 and 300 separate buildings for religious services. The charitable institutions include St. Peter's Hospital, the Colston Societies, the Merchant Venturers' Society, the Ashley Down Orphanages and innumerable asylums, homes, and schools.

Government, History, and Population.—The city government is vested in a mayor, and a council consisting of 22 aldermen, elected for 6 years, and 66 councillors, elected for 3 years. The city returns 4 members to Parliament.

The first records of the history of B. speak of it under the ancient British name of Caer-oder; it then became a stronghold of the Romans; on their departure, was again occupied by the Britons, until, 584, the Saxons drove them out, and giving it the name of Brightstowe or Bricstowe, made it a thriving place of trade—aboriginal slaves being a principal item in the commerce. It was sacked by the Danes. Henry III. gave it the rights of a corporate town; Edward III., those of a city and county in itself. In 1247, the parishes of Redcliffe, Temple, and St. Thomas were added to B. During the civil wars, it was alternately taken by royalists and parliamentarians, and by the latter, the castle and fortifications were razed. It afterward became the principal port for trade with the West Indies, and carried on a flourishing business in negro slaves. In 1793, the 'Bridge Riots' occurred. In 1804 the docks were begun, and in 1809 they were opened to shipping. In 1831, the 'Reform Bill Riots' resulted in the destruction of the bishop's palace, custom-house, excise-office, jail, toll-houses, a number of private residences, and several lives. The bill itself, by the addition of Clifton, etc., gave the city its present municipal boundaries. Among the names of note in the history of B. are those of the Fitzhardinge family; William of Worcester; Canynge, the great merchant and restorer of Redcliffe Church; Colston and Whitson, merchants and philanthropists; Sebastian Cabot, the navigator, the poets Southey and Chatterton; Lawrence and Baily, artists; Sydney Smith, canon of Bristol Cathedral; Robert Hall, Coleridge, and Hannah More; the Misses Porter, and others. Pop. (1901) 328,842; (1907) estimated 354,443.

BRISTOL, Augusta Cooper: American writer and lecturer: b. Croydon, N. H., 1835, April 17. She was married to Louis Bristol in 1866. She was State lecturer to the Patrons of Husbandry of New Jersey (1881–4), and teacher of French since 1899, and is the author of *Poems* (1868); *The Relation of the Maternal Function to the Woman Intellect* (1876); *The Philosophy of Art* (1880); *The Present Phase of Woman's Advancement* (1880); *Science as the Basis of Morality, The Web of Life,* a collection of poems, (1895).

BRISTOL BAY: arm of the Pacific Ocean in N. America, n. of the peninsula of Alaska. Bristol Bay receives the waters of two considerable lakes.

BRISTOL CHANNEL: inlet of the Atlantic Ocean, in the s.w. of England, between s. Wales on the n., and Devon and Somerset shires on the s.: it may be regarded as an extension of the estuary of the river Severn. It is about 80 m. long and 5 to 48 m. broad, the greatest breadth being between St. Gowan's Head and Hartland Point, its most western and external points, this line passing through Lundy Isle. It is the largest inlet or estuary in Britain, having a very irregular coast-line of 220 m., and receiving a drainage of 11,000 sq. m. The chief rivers which flow into it are the Towy, Taff, Usk, Wye, Severn, Avon, Axe, Parrot, Taw, and Torridge. The tides in it rise to an extraordinary height—at Bristol, 35 ft.; at King's Road, 40; and at Chepstow, sometimes 70. The rapid flow of the tides meeting the currents of the rivers produces, in the narrow parts of channel, and in the mouths of one or two of the rivers which enter it, the phenomenon of the *bore*, the tide advancing like a wall of water sometimes 6 to 9 ft. high. The chief bays and harbors are, on the n., Caermarthen and Swansea bays, Cardiff Roads, the mouths of the Usk and Wye, and the Severn estuary; and on the s., Bideford or Barnstaple, Morte, Ilfracombe, Combe Martin, Minehead, Porlock, and Bridgewater.

BRISTOW, Benjamin Helm, American lawyer: b. Elkton, Ky., 1832, June 20; d. 1896, June 22. He was admitted to the bar in Kentucky in 1853. He served with distinction in the Civil War, and at its close was appointed United States district attorney of Kentucky. In 1874 he became secretary of the treasury, and made his name memorable by the exposure and prosecution of a notorious whiskey ring.

BRISTOW, George Frederick, American musician: b. Brooklyn, N. Y., 1825; d. New York, 1898. From 1851 to 1862 he was the conductor of the New York Philharmonic Society, and later of the Mendelssohn Union. He wrote *Rip Van Winkle*, an opera produced in New York 1855; *Daniel*, an oratorio (1867); *Arcadian Symphony* (1874); and *The Great Republic*, a cantata (1880).

BRISTOW, Joseph L. American politician: b. Flemingsburg, Ky., 1861, July 22. He was educated for the ministry, but became editor of the Salina, Kan., *Republican*, and soon after entered politics. He was secretary of the Republican State Committee in 1896, and from 1897–1905 was fourth assistant postmaster-general. In 1900 he became active in exposing frauds in the postoffice department. In 1905 he was appointed a special Panama R. R. commissioner.

BRITANNIA, *brĭ-tăn′nĭ-a* [perhaps from Celtic *brith* or *brit*, painted, the ancient Britons being in the habit of painting their bodies blue with woad]: ancient name of the island of Great Britain (see BRITANNICÆ INSULÆ). The Romans under Julius Cæsar (who wished to chastise the Britons for aiding the Veneti, a tribe in Gaul, against the Roman power) invaded Britain B.C. 55 and 54, but made no permanent conquest. Nearly a hundred years after, A.D. 43, the real conquest began under Claudius; and in spite of a desperate resistance by the native British princes, especially Caractacus and Queen Boadicea, the s. half of Britain was conquered, and made a Roman province. Agricola, sent by Nero, 78, consolidated these conquests, and extended the influence of Rome to the Firths of Forth and Clyde, between which, 84, he erected a chain of forts to repel the inroads of the northern Caledonians, in the line of the stone Wall of Antoninus, erected 140 by Lollius Urbicus. Agricola was the first Roman to send a fleet round the island, and the first Roman general to come in contact with the Caledonians, whom, under their leader Galgacus, he overthrew, in 84, at a hill called the Mons Grampius, the situation of which has not been satisfactorily determined. The Romans made many ineffectual attempts to subdue the Caledonian barbarians, and penetrated, for this purpose, through the n.e. of Scotland as far as the Moray Firth, as is still attested by the remains of Roman camps and stations along their line of march, and the relics of Roman art found in connection with them. Not only did the Caledonians on their own soil resist the Roman sway, but by constant inroads into the Roman territory s. of the Wall of Antoninus, they so harassed the Romans themselves, that the latter were forced to abandon their conquests for 80 m. s. of that wall, and to secure permanently their remaining conquests in s. Britain by a line of defensive works between the mouth of the Tyne and the Solway Firth. Here Agricola had raised a line of forts, and here in 120 Hadrian built a wall, which was repaired by Severus 210. After 210 the Romans did not attempt to regain their lost provinces. Subject to these incursions of the Caledonians, the opposition of the native British princes, and the invasion of tribes from the opposite shores of the continent, the Romans held sway in Britain till about 410, soon after which time the Saxons invaded s. Britain, and ultimately subdued it. Britain, s. of the Solway Firth and the mouth of the Tyne, in the reign of Claudius, formed one Roman province under a consular legatus and a procurator. Ptolemy mentions 17 native tribes as inhabiting this tract. Toward the close of the 4th c., Roman Britain constituted a diocese in the prefecture of Gaul, and was divided into five provinces, of which the boundaries, though uncertain, are supposed to have been as follows: B. Prima, England south of the Thames and the Bristol Channel; B. Secunda, Wales; Flavia Cæsariensis, the country between the Thames, Severn, Mersey, and Humber; Maxima Cæsariensis, the rest of England to the Scottish border; and Valentia—soon abandoned by the Romans—or Scotland s. of the Wall of An-

tonius. The population of Roman Britain included Roman and Germanic elements, which had partially blended with the native Britons, who were of Celtic stock, with an earlier Euskarian or Basque admixture. The Romans governed Britain by a vicarius or vicegerent resident at Eboracum (York), under whom were consulars, presidents, and other subordinate officers. To insure the obedience of the natives, at least three Roman legious—composed chiefly of Gauls, Germans, Iberians, and a few pure Romans—were stationed in Britain; viz., at Eboracum, Deva (Chester), and Isca (Caerleon) in s. Wales. Under the Romans, many towns (coloniæ and municipia)—56 are enumerated by Ptolemy—arose in Britain, and diffused Roman law and civilization over the country. The towns of Eboracum (York) and Verulamium, near St. Albans) had the privileges of Roman citizenship. The Romans made many roads or streets (*strata*), of which there are still numerous remains, across the country, all centring in London. They also developed it into a grain growing country. Druidism was the religion of the Britons at their conquest by the Romans, but the latter introduced Christianity and Roman literature into the country. There are many remains extant of the presence of the Romans in Britain, such as camps, roads, ruins of houses, baths, flues, altars, mosaic pavements, painted walls, metallic implements and ornaments, weapons, tools, utensils, pottery, coins, sculptures, bronzes, inscriptions, etc. These remains show that the Romans wished to render their British conquests permanent, and that they had greatly improved the arts of the ancient Britons, as is evident on comparing the remains with the far ruder native antiquities of the British pre-Roman or pre-historic era, such as tumuli, barrows, earthworks, so-called Druidical monoliths and circles, cromlechs, cairns, pottery, weapons, tools, utensils, ornaments, etc. Many of the Roman remains in Britain show also that the Romans had introduced into the country the refinements and luxuries of Rome itself.

Under the term BRITANNIA, Great Britain has been personified in the fine arts as a female seated on a globe or on an insulated rock, and leaning with one arm on a shield, the other hand grasping a spear or a trident. The first example of this personification is on a Roman coin of Antoninus Pius (died 161). The figure reappears first on the copper coinage of England in the reign of Charles II. (1665); the celebrated beauty, Miss Stewart, afterward Duchess of Richmond, is said to have served as model to the engraver, Philip Roetier. The Britannia that appears on the reverse of British copper coins since 1825 was the design of Mr. W. Wyon. See Scarth's *Roman Britain* (1883).

BRITANNIA METAL: an alloy that has come into very general use in modern times, many domestic uten-

sils, such as spoons and teapots, being made of it. Such articles are commonly electro-plated, and made to resemble real silver. It consists chiefly of tin and antimony, but often contains also a small quantity of copper, zinc, and bismuth. A common proportion is 140 parts if tin, three of copper, and nine of antimony; but the best alloy is composed of 90 parts of tin and 10 of antimony. The copper is used mainly to impart color to the combination. The manufacture was begun at Sheffield by Hancock and Jessop, 1770; it reached Birmingham toward the close of the century, and made gradual progress. At first, the articles were made by stamping with dies, and soldering up into form; this slow operation rendered the articles expensive. Afterward, the curious process of *metal-spinning* was introduced; and this, with the subsidiary operation of swaging, rendered a great reduction in price possible. In the spinning process, a thin sheet or piece of Britannia metal is placed upon a wooden model shaped like the article to be made; the model is made to rotate in a lathe; and burnishers and other tools are employed to press the yielding metal into all the curvatures of the model. Ductility is an essential quality to the attainment of this end with the metal; how complete it is, may be seen in such articles as Britannia metal teapots and dish-covers, the principal forms of which are not given by hammering, stamping, or casting, but by spinning. Besides spinning and swaging, the processes include stamping, soldering, casting and polishing. Since electro-plating has been introduced articles made of Britannia metal are commonly silver plated.

BRITANNIA TUBULAR BRIDGE: railway bridge over the Menai Strait, remarkable alike for its gigantic dimensions, and as being the first construction of the kind ever undertaken. To facilitate communication with Ireland *via* Holyhead, the directors of the Chester and Holyhead railway in 1845 sought the aid of Robert Stephenson, the great engineer, to bridge the strait with a structure for the safe passage of heavily laden trains without in any way interfering with the navigation of the channel. About a mile above the suspension-bridge, and nearer Carnarvon, a rock in the middle of the strait rose ten ft. above the water at low tide; and on this site, provided by nature, it was resolved to erect the bridge in the form of a rectangular tube, composed of wrought-iron plates riveted together in a manner to combine the greatest strength with the greatest lightness. See STRENGTH OF MATERIALS and TUBULAR BRIDGES. In the spring of 1846, the undertaking was commenced; by 1849, June 22, the Britannia Tower on the rock in the centre of the strait was completed (height, 191 ft. 6 in. above highwater mark). Other two towers, some 18 ft. lower, were erected on each side

of the Britannia Tower; thus dividing the spaces into four spans, of which the two centre ones are 460 ft. each, the other two comparatively narrow. The short tubes between the abutments and the shore towers were constructed, by means of strong scaffolding and stages, in the places they were to occupy when finished; the long central tubes were built at the water-edge, whence they were floated on pontoons to the base of the towers, which had grooves or recesses made to receive them, and then elevated gradually (supports being built under their ends as they ascended) by powerful hydraulic presses to the requisite height, 102 ft. above high-water mark. 1849, Oct. 13, the first long tube, 472 ft. in length (12 ft. being allowed for the rest at both ends), and about 1,800 tons in weight, was safely fixed at its proper height above the sea. The other centre tube was raised by December; and 1850, Mar. 5, a train swept through, and the bridge was open for traffic. In Aug. the parallel line of tubes was completed, and the up and down trains could now pass over the Menai with as little delay and danger as over any other part of the line. The total length of the bridge is 1,841 ft., of the tubes, 1,513 ft. The extreme height of the tube at the Britannia Tower is 30 ft., diminishing to 22 ft. 9 in. at the abutments, 'the difference being made to give a true parabolic curve to the top while the bottom is straight.' Inside, the width is 13 ft. 8 inches throughout, and the height 26 ft. at the middle, and 18 ft. 9 inches at the ends. To provide for the expansion and contraction of the metal, the bed-plates in the shore towers and in the abutments, on which the tubes rest, are made to move freely on cast-iron rollers and balls. This precaution, for securing free movement to the tubes, was not unnecessary, as it has been found that between the expansion of summer and contraction of winter there is a difference of fully 12 inches. The total weight of iron used was nearly 12,000 tons, of which the tubes contain 9,360 tons of malleable iron, 1,015 tons of cast-iron, and 175 of permanent railway. In their fabrication 186,000 different pieces of iron, fastened together by more than 2,000,000 rivets, were used; and in the towers, abutments, etc., there are 1,492,151 cubic ft. of masonry. The total cost was about £602,000. The whole structure was completed in less than five years. See TUBULAR BRIDGE.

BRITTANIC, a. *brĭ-tăn'nĭk* [L. *Britannia*, Britain]: pertaining to Great Britain; British. BRITAN'NIA-METAL, n. a metallic alloy of block-tin, antimony, zinc, and copper. BRITISH, a. n. *brĭt'ĭsh* [AS. *Brittisc*]: pertaining to Britain, or its people. BRITISH-GUM, a substance of a brownish color, very soluble in cold water, formed by heating dry starch to a temperature of about 600° F. BRIT'ON, n. *-ŏn*, a native of Britain: see BRITANNIA.

BRITANNICÆ INSULÆ, *brĭ-tan'nĭ-sē ĭn'só-lē:* in ancient classic writers previous to Cæsar, a term designating the British Isles, including Albion (England and Scotland), and Hibernia or Ierne (Ireland), with the smaller isles around them. Aristotle, in the beginning of B.C., 3d c., knew only of Albion and Ierne. Cæsar, about B.C. 54, was the first to apply the name Britannia to Albion. Ptolemy, 2d c. after Christ, is the first to apply Little Britain to Ierne or Ireland, and Great Britain to Albion or England and Scotland. Herodotus, B.C. 5th c., is the first writer to mention Britain with any sort of definiteness; previous Greek writers speak of Britain only in connection with the Phœnician tin trade carried on with the Cassiterides or Tin Isles (the Scilly Isles and Cornwall), which they often confound with the Azores. The Phœnician trade with the British Isles began about B.C. 1000, the Phœnicians giving the native Britons salt, skins, and bronze vessels in exchange for tin and lead. Ptolemy enumerates 52 different Celtic or Gaelic tribes as inhabiting Britain in his time. See CELTIC NATIONS.

BRITANNICUS, *brĭ-tăn'nĭ-kŭs:* son of the Roman emperor Claudius: see NERO.

BRITISH AMERICA: see AMERICA, BRITISH.

BRIT'ISH ASSOCIA'TION: association for bringing together men eminent in all the several departments of science, to assist the progress of discovery, and to extend over Great Britain the latest results of scientific research. A prevailing impression that England had fallen behind other countries, both as to the general estimation in which scientific men were held, and as to the prosecution of science itself, led to its formation. It was thought that an imposing union of men of science with the nobility, gentry, and clergy might tend to revive the philosophic spirit of the country. Such meetings in Germany probably suggested the idea of this institution. Many leading men took part in its formation, but the honor of being its founder must be ascribed to Sir David Brewster. By his exertions the first meeting of those favorable to the design was held at York 1831. The Abp. of York, the mayor and council of the city, entered warmly into the project. At this meeting the constitution of the society was determined, the several sections had their provinces assigned to them, and subjects were proposed on which reports were to be drawn up and read at the ensuing meeting, which was held at Oxford 1832, with the warm welcome of the university. The jubilee meeting was held at York 1882. An enumeration of the several sections of the society, each of which has its own committee and president, will show its range of topics: Section A., Mathematical and Physical Science; B., Chemistry; C., Geology; D., Zoology and Botany, including Physiology; E., Geography and Ethnology; F.,

Economic Science and Statistics; G., Mechanical Science; H., Anthropology; I., Physiology; K., Botany; and L., Educational Science. Local committees are formed to arrange for meetings, etc. The important national benefits conferred by the labors of various members of the association have long been duly recognized. Among these may be mentioned more especially the experiments on electricity and magnetism which have achieved such important consequences in the establishment of the electric telegraph and a more thorough knowledge of the laws which govern the weather and other meteorological phenomena. In mechanical science also the labors of members of the British Association have been productive of the most important results. As the funds which the society collects at each meeting are more than sufficient to cover its expenses, it is enabled each year to make direct grants for the pursuit of particular scientific inquiries, which otherwise could not be conducted so efficiently, if at all; but besides this direct encouragement, its indirect influence on the promotion of science is undoubtedly great in many ways. Among the presidents of the association have been many distinguished men, including Dr. Whewell (1841), the Earl of Rosse (1843), Sir John Herschel (1845), Sir R. Murchison (1846), Sir David Brewster (1850), Sir George Airy (1851), Sir Richard Owen (1858), Prince Consort (1859), Lord Armstrong (1863), Sir Charles Lyell (1864), Sir J. D. Hooker (1868), T. H. Huxley (1870), Lord Kelvin (1871), J. Tyndall (1874), Sir John Lubbock (1881), Lord Rayleigh (1884), Lord Playfair (1885), Sir William Huggins (1891), Sir A. Geikie (1892), and Sir W. Crookes (1898).

BRITISH CENTRAL AFRICA PROTECTORATE, THE: a portion of British Central Africa, lying around the shores of Lake Nyasa, and extending to the banks of the Zambesi. It includes all British Nyasaland, as well as the Shire Highlands, and the greater part of the basin of the river Shire. The expenses of administering the Protectorate are partly met out of revenue locally raised, and further by an annual grant from the Imperial Gov. The administration is in the hands of a commissioner, acting under Foreign Office. The port of Brit. Cent. Africa is Chinde, at mouth of Zambesi, where a small concession has been granted by Portuguese gov. Area of Protectorate is 38 sq. m. Principal occupation of European settlers is planting; thriving plantations of coffee, sugar, cinchona, and tobacco have been established. The chief towns, Blantyre, Zomba, Fort Johnston (the principal port on Lake Nayassa, and naval depot), Karonga (north end of Lake Nyassa), the starting point for Tanganyika, and Kotakota (west coast of Lake Nyassa). The Protectorate is divided into 12 districts, managed by a number of collectors, judicial officers, etc.

BRITISH COLUMBIA: a province of the Dominion of Canada. The total area is officially stated at 409,910 sq. m. The province borders on the United States and on the Canadian n.w. territories. In 1858 the n. limit was the parallel 55° n., and the total area 120,000 sq. m. Now it extends between lat. 48° 20′ and 60° n., and long. 113°-136°. For a description of Vancouver see VANCOUVER.

Topography and Hydrography.—Running parallel with the Rocky Mountains on the e. border, which rise, in Mount Browne, to a height of 16,000 ft., two ranges divide the width of the country into three sections of drainage. In the e. are head-waters, which find opposite outlets in the estuaries of the Columbia and of the Mackenzie; through the entire middle and part of the east, the Fraser maintains a southerly course, till, at Hope, it is bent sharply to the right by a mountain barrier, so as to enter the Gulf of Georgia about 10 miles north of the international boundary; and lastly, across the w., a series of streams, generally meeting long and narrow inlets of the ocean, and terminating in the Skeena, which, with its upland reservoir, Babine Lake 100 m. in length, is but little inferior to the Fraser itself. The principal harbors are Burrard Inlet, on the Gulf of Georgia, a few miles from New Westminster, and the chief port for the lumber trade; Howe Sound, n. of Burrard Inlet; Bute Inlet, farther n.; Millbank Sound, which will become valuable as the gold mines on the Peace river attract population; the river Skeena, now ascended by steam-vessels, and one of the routes to the Ominica gold mines; and the river Nass, near the frontier of Alaska, watering a region also believed to be rich in gold.

The interior of British C., *i.e.*, the region between the Cascade Range and the Rocky Mountains, is, on the whole, rugged and lofty, and though rivers are numerous, they do not serve the purposes of irrigation, being often confined within deep ravines. Still the tracts of arable land are of considerable extent, and very fertile. The pastures of British C., are, however, likely to prove much more valuable than its arable ground. They are almost endless in extent. On the Cariboo road (between Soda Creek and Quesnel) there is a plain 150 m. long, and 60 or 80 wide; and between the Thompson and Fraser rivers there is an immense tract of grazing land. The hills and plains are covered with bunch grass, on which the cattle and horses live all winter, and its nutritive qualities are said to exceed the celebrated blue grass and clover of Kentucky and Virginia.

Climate.—The climate varies according to the locality, owing principally to four causes: (1) greater or less distance from the sea; (2) greater or less distance from the mountain regions; (3) difference in the variety and growth of vegetation; (4) difference of level. The low portions near the sea and on Vancouver Island have a moderate climate, with a temperature ranging from 20° in winter to 80° in summer. The [illegible]ng is short, lasting from the be-

Longitude West from Greenwich
140° 135° 130° 125° 120° 115° 110° 105° 100° 95°
60° 55° 50°
YUKON
TERRITORY
NORTHWEST
TERRITORIES
BRITISH
COLUMBIA
ALBERTA
SASKATCHEWAN
KLONDIKE REGION
GREAT BEAR LAKE
GREAT SLAVE LAKE
REINDEER OR ATHABASKA LAKE
Fort Franklin
Fort Enterprise
Fort Simpson
Fort Providence
Fort Resolution
Fort Liard
Fort Smith
Fort Vermillion
Fort Chipewyan
Fort McMurray
McLeods Fort
Fort St. John
Fort Connolly
Dunvegan
Fort Babine
Fort Essington
Fort St. James
Fort Fraser
Fort George
Hazelton
Telegraph Cr.
Glenora
Sitka
JUNEAU
SHEEP MT.
Dawson
Fort Selkirk (Ruins)
McMillan
Pelly Lakes
MT. LOGAN
Fort Frances
Ft. du Tremble
H. B. Post
Little Slave Lake
Victoria Ft.
Battleford
Prince Albert
Saskatoon
Edmonton
Calgary
Banff
Lethbridge
Medicine Hat
Regina
Moose Jaw
Swift Current
Yorkton
Brandon
Winnipeg
Portage la Prairie
Minneapolis
Duluth
Shelby
Milk River
Glasgow
Milk River
Ft. Assiniboine
Great Falls
Helena
Butte
Missoula
Spokane
Seattle
Tacoma
Portland
Victoria
Vancouver
Nanaimo
Nootka I.
Queen Charlotte Is.
Vancouver I.
Prince of Wales I.
Dixon Entrance
Hecate Str.
Juan de Fuca Str.
Strait of Georgia
Gulf of Georgia
Lake Athabasca
Great Slave Lake
Great Bear Lake
Peace River
Mackenzie River
Yukon River
Fraser River
Columbia River
Kootenay River
Saskatchewan River
Athabasca River
Red River
Missouri River
Rocky Mts.
Selkirk Mts.
Cascade Mts.
Coast Range
Continental Divide
BRITISH COLUMBIA
ALBERTA AND
SASKATCHEWAN.
SCALE OF STATUTE MILES.
0 50 100 150 200 250
Copyright, 1905, by Rand, McNally & Co.
RAND, MCNALLY & CO., ENGR'S, CHI.

ginning of March to the early part of May; summer, from May until Sept., the next two months are autumn, of which winter is merely an aggravation, the snow being light, and the frost far from severe or lasting.

Animal Life.—The most valuable of the fur animals are the black and silver fox, sea otter, red fox, fur seal, mink, martin, beaver, and common otter. Bears, goats, and sheep are found on the mountains; elk on the coast, and deer on the groups of small islands; wild ducks and geese, grouse and snipe abound; and a kind of tall buff crane, 4-5 ft. high, inhabits the plains.

Forests and Lumbering.—The forest lands are of vast extent, and yield most valuable timber. The principal trees are the Douglas pine, Menzies fir, yellow fir, balsam, hemlock, white pine, yellow pine, cedar, yellow cypress, arbor vitæ, yew, oak, white maple, arbutus, alder, dogwood, aspen, cherry, willow, and cotton-wood. The Douglas pine is almost universal on the sea-coast and up to the Cascade Range. The cedar, white pine, and maple are found everywhere; the Scotch fir, the willow, and cotton-wood on the bottom-lands. The Fraser river and its tributaries, with the numerous lakes communicating with them, furnish great facilities for the conveyance of timber. The lower Fraser country especially is densely wooded. Smaller streams, and the numerous inlets and arms of the sea, give communication for the region farther north. In 1902 there were 105 lumber mills in the province with an area under lease of 453,251 acres, and a product of 281,945,866 ft., with a net revenue to the province of $215,275. The marvellous growth of the lumber industry may be seen when it is stated that up to 1871 the lumber cut of the province was estimated at 250,000,000 ft., and from 1871 to 1888 at 595,000,000 ft. In 1888 there were 25 saw-mills, and the lumber cut was 31,868,884 ft.; in 1898 there were 45 saw-mills and the cut amounted to 124,546,658 ft. In 1902 the exports of lumber were 57,121,435 ft., while in 1904 two of the largest concerns—the Hastings and the Chemainus saw-mills—shipped a total of 43,033,782 ft., valued at $535,545.

Fisheries.—The fisheries of British C. are among the richest in the world, and have, though only in recent years, been largely developed in some departments. Seals abound off the n. coasts. Sturgeon are plentiful in the rivers and estuaries; they are found weighing over 500 lbs., and are easily caught. The salmon of the Fraser river are famous over the American continent, and are now extensively canned. Cod, herring, halibut, black-cod, shad, oil-fish, bass, whitefish, the oolachan, trout, etc., abound. The salmon industry seems to be declining instead of growing. In 1896 the pack amounted to 601,570 cases, in 1897, to 1,015,477 cases, and in 1901 to 1,236,156 cases. In 1902 the total declined to 625,982 cases and in 1904 reached only 465,847 cases. In 1904 the total value of the fishery production was $5,219,107. In 1903 the number of seals killed was 20,496; in 1893 it was 70,592.

BRITISH COLUMBIA.

Minerals and Mining.—To its mineral resources, mainly, British C. owes its present position. It was the discovery of gold, 1857—coinciding as it did with the expiration of the Hudson's Bay company's licensed monopoly—that led to the establishment of the colony, 1858, and that has since drawn flocks of adventurers from the United States, from Great Britain and its dependencies, and from China.

The attractiveness of mining is a hindrance to the regular development of the other resources of the province. Copper, lead, cobalt, talc, platinum, cinnabar, and agate occur; silver has been obtained in considerable quantities Gold may be said to be universally diffused. New mines were opened, 1871, in the north, in the Peace and Ominica district. Silver mines have been opened in the Fraser valley. Coal and iron also are found. The total mineral production of the province up to and including 1904 was valued at $226,201,851. The total production of placer and lode gold up to the end of 1904 was $98,255,359; that of silver $21,716,870; of lead $12,559,139; of copper $21,381,791; of coal and coke $68,274,893; of other minerals $4,013,799. The total production of the mines in 1895 was $1,266,954; in 1900 it was $4,732,105; in 1904 it was $5,747,000; in 1905 about $15,000,000.

Agriculture, Manufactures, Etc.—Arable lands form only a small part of the total area of the province. The Fraser River valley produces vegetables and fruits, and in the southern section there are many scattered districts well adapted to ranching and agricultural pursuits. In the Okanagan district fruit farming and hop-raising are the chief pursuits and the southern plateau and portions of the interior are also well adapted to the cultivation of these products, more particularly hops, because the Indians supply the labor necessary for picking the harvest. Pasture lands are of considerable value especially the immense tract of grazing land between the Thompson and Fraser rivers, and the plain about 150 m. long and from 60 to 80 m. wide, between Soda Creek and Quesnel on the Cariboo road. Dairying has in consequence become of more importance during the last few years; the creamery system is in vogue and according to the latest statistics there were 8 creameries in the province. The annual income of the province is estimated as follows: Fisheries, $4,546,377; animals, $14,987,174; forest and furs, $2,835,-555; farm dairy products, $1,240,226; field crops, $3,100,-577; fruits and vegetables, $453,938; wool, $8,288; eggs, $426,620.

According to the census of 1901 the capital invested in the manufacturing industries was $22,901,892; the salaries and wages aggregated $5,456,538; the miscellaneous expenses were $991,847; the cost of material was $7,246,-684; and the value of the products amounted to $19,447,-778.

Commerce, Transportation and Finance.—The completion and opening of the Canadian Pacific railway in

1887 has proved of immense importance in the development of the province. The terminus is Vancouver City, on Coal Harbor, near the entrance to Burrard Inlet. The Grand Trunk Pacific will enter the province within a few years, the Great Northern of the United States has already reached Vancouver, and the Canadian Northern expects to cross the mountains before many years. Other and smaller lines are under construction or being actively promoted. River navigation is limited as the rivers are too precipitous; steamers ply the Fraser as far as Fort Yale and smaller boats run upon its upper waters and on Lake Okanagan, and Arrow, Slocan and Kootenay Lakes, but the interior depends upon overland routes and the branch lines of the railroads. There is considerable trade with Australia, China and Japan through Victoria and Vancouver by the Canadian Pacific and Empress Line steamers. The imports of the province in 1903 were $11,141,068, and in 1905 $12,565,019. The exports were, respectively, $15,604,896 and $16,677,882. The revenues of British Columbia in 1902-3 were $2,044,630 and the expenditure $3,393,182. In 1903-4 they were, respectively, $2,638,260 and $3,030,237. There was deducted from this $470,743, specially provided for the Fraser River Bridge, and $51,059 railway subsidies were added, thus showing the net expenditures to be $2,610,553. Between 1892 and 1903 the total revenues were $16,121,785 and the expenditures $24,743,377. The provincial liabilities in 1904 were $13,534,440, including loans payable in London amounting to $11,805,836. The assets were $4,770,028. The banks of Canada have established branches throughout the province; there are also post-office and government savings banks. In 1900 the clearing-house transactions at Vancouver were $46,160,000 and at Victoria $32,000,000.

Religion and Education.—According to the census of 1901 the population was divided denominationally as follows: Church of England 40,689; Roman Catholic 33,639; Presbyterian 34,081; Methodist 25,047; Baptist 6,471; and Lutheran 5,332. Of the Oriental foreigners 10,027 were Buddists and 4,859 Confucians. The public school system of the province is free but entirely under secular control. The city school districts are separated into three classes according to the average daily attendance of pupils and a per capita allowance of $13, $15 or $20 according to its standing is given by the Provincial Government to each district, while additional expenses are locally provided for. The board of school trustees for city school districts is composed of three, five or seven members according to the standing of the districts, as above, whereas the rural district boards invariably have three members. There are common, graded, and high schools and also a number of private schools. In 1906 there were 28,522 pupils enrolled in the public schools, and the average daily attendance was 19,506; the total number of teachers was 690; the government expenditures

aggregated 418,227 and the 17 incorporated cities of the province expended $144,451.

Government.—British C. is represented in the Canadian parliament by three senators and seven members of the house of commons. It has a local legislature consisting of one chamber of 42 members, a lieutenant-governor, appointed by the Dominion government, and an executive council. The supreme court is composed of a chief justice and four judges. There are 11 county court judges.

Population.—According to the census 1871, the total pop. was 10,586, exclusive of Indians, estimated at 30,000 to 50,000, but whose numbers are diminishing from small-pox, measles, and tribal wars, and in 1905 amounted to only 25,142. The census (1901) showed total pop. 177,272. As to origin 104,589 were English, Irish or Scotch, 25,488 were Indian and 19,482 Chinese or Japanese. There were 10,088 persons classed as 'Americans' in the province and 17,164 who had been born in the United States. The rural population was 87,825 and the urban 89,447.

History.—British Columbia is supposed to have been visited by Drake 1578-9, was afterwards visited by San Juan de Fuca 1592, after whom the Strait is named, by Juan Perez in 1774, and by Behring, the Dutch navigator, in 1748. The country was not extensively explored, however, till the arrival of Cook in 1778, and of Captain George Vancouver in 1792 who made a survey of the coast lines and after whom the island was named. In 1788 John Meares had established a settlement at Nootka which was soon after broken up by the Spanish and in rapid succession came Hanna, Portlock, Dixon, Haro, Duncan and Barclay and the overland expeditions from the east under Sir Alexander Mackenzie 1793, Lewis and Clark 1804-6, Thompson 1807, Simon Fraser 1808, and Astor 1810-11. From that time the Hudson's Bay Company began to establish trading posts and carry on an extensive fur trade with the Indians. In 1838 this company was given exclusive trading rights in Vancouver Island and New Caledonia, as the mainland was called. In 1846 the dispute with the United States concerning the Oregon boundary was settled by treaty.

In 1849 Vancouver Island became a Crown colony, special terms having been made with the Hudson's Bay Company who had till then governed it and the mainland of New Caledonia under the royal charter of 1670. Gold was found in the Fraser river in 1856 and a stampede from the United States began. This discovery was quickly followed by the Horsefly and the Quesnelle, the William Creek and the Cariboo placer mines discoveries, all of which brought an enormous number of settlers to the province. The most influential figure in the years 1856 to 1864 was Sir James Douglas who, besides being chief factor of the Hudson's Bay Company, was also from 1856-64 the representative of the Crown. In 1858 New Caledonia had also become a Crown colony under the

name of British Columbia; in 1866, Nov. 17, the two colonies were united as British Columbia; the first legislature of the new province met at Victoria in 1868; and on 1872, Jan. 20, the province was admitted into the Canadian Confederation.

The boundary lines between British Columbia and United States territory both north and south of it were the causes of many disputes between Great Britain and the United States, particularly the San Juan boundary. This was however settled in 1872. The decision of the German emperor (1872, Oct. 21), as umpire on the San Juan Boundary Question, affirmed the accuracy of the American interpretation of the treaty of 1846, in virtue of which the boundary of the United States runs through the Haro Channel, and the San Juan archipelago, lying between Vancouver's Island and the mainland, and commanding the outlet to the Pacific, has been assigned to the United States. The progress of the province since then has been steady, its peace and tranquillity only marred by the disputes over the non-completion of the Canadian Pacific railway and minor local disturbances. Consult Dawson (and others) *Reports of the Geological Survey of Canada*, and the *Official Publications of the Province of British Columbia;* Mill, *New Land* (1900); Green, *Among the Selkirk Glaciers* (1890); Baillie-Grohman, *Fifteen Years in the Hunting Grounds of Western America and British Columbia* (1900); Ingersoll, *The Canadian Guide-Book*: Part II, *Western Canada* (1893); Gosnell, *Year Book of British Columbia* (1903); Begg, *History of British Columbia* (1894).

BRITISH EAST AFRICA: an immense territory of East Africa, between German East Africa and the Italian protectorate of Somaliland; area, over 1,000,000 sq. m.; pop. estimated at between 2,000,000 and 3,000,000. The coast extends from Wanga, 4° 40′ s. lat., to the mouth of the Juba river, 0° 15′ s. lat. The territory contains the valley of the Upper Nile and the mountainous region of Equatorial Africa, in which are the high mountains of Kenia, Elgon, and Ruwenzori. Ivory, gum, India rubber, sesame seeds, cocoanuts, copra, coir, maize, rice, and hides are exported. The government is principally vested in the British East Africa Company, which was founded in 1888, with a royal charter, but in 1894, Uganda, n. of Victoria Nyanza, was made a separate British protectorate, and received a separate administration. Darpur and Kordofan are merely in the sphere of British influence, by agreement with Germany and Italy. The British East Africa Company is rapidly opening up the country, constructing roads and telegraphs, and taking steps to suppress slavery and the slave trade. The seat of administration is at Mombasa. The coast is unhealthy for Europeans, but most of the interior plateaus are salubrious.

BRITISH EMPIRE: see GREAT BRITAIN and IRELAND.

BRITISH GUIANA: see GUIANA, BRITISH.

BRIT'ISH MUSE'UM: important national institution in London. It originated in a bequest of Sir Hans Sloane, who, during a long lifetime, gathered an extensive and, at the time, unequalled collection of objects of natural history and works of art, besides a considerable library of books and manuscripts. These, in terms of his will, were offered, 1753, to the government, on condition that £20,000 should be paid to his family, the first cost of the whole having amounted to more than £50,000. The offer was accepted; the necessary funds were raised by a lottery; and the collection, with the Harleian and Cottonian Libraries, were arranged in Montague House, purchased for £10,250. The institution, thenceforth called the BRITISH MUSEHM, was opened in 1759. From time to time, purchases and donations succeeded each other rapidly. Montague House sufficed for these acquisitions, till the Egyptian antiquities arrived in 1801. The purchase of the Townley marbles, 1805, necessitated the erection of a gallery for their reception. This, however, did not meet the increasing demand for space. The old house was condemned, and plans were prepared by Sir R. Smirke for new buildings; but none were undertaken till 1823, when the eastern wing of the present building was erected for the reception of the library of George III., which had been presented to the museum by George IV. The subsequent progress of the works was very slow. The building was completed 1847. It forms a hollow square, facing the cardinal points. The south, or Russell street, front, is the principal one, having an imposing columnar façade of the Ionic order. This, as well as the other three, looks into the central square court, which measures about 320 feet by 240. There are two stories of galleries and rooms round the greater part of the building. Smirke's designs were no sooner completed than it was found that additional accommodation was needed in various departments, and several new rooms were provided; but the library accommodation being wholly inadequate for the accommodation of the readers, as well as for the reception of new books, a grant was obtained from Parliament for a new library building in 1854, and it was ocmpleted and opened in 1857, at a cost of $750,000. It was erected in the interior quadrangle, and contains a circular reading-room 140 ft. in diameter, with a dome 106 ft. high. The whole arrangements have been completed with the utmost economy in regard to space, and besides ample accommodation for books, the reading-room now contains accommodation for 300 readers comfortably seated at separate desks, which are provided with all necessary conveniences. More recently, the accommodation having become again inadequate, it was resolved to separate the objects belonging to the natural history department from the rest, and to lodge them in a building by themselves. Accordingly a large natural

history museum has been erected at South Kensington, and the specimens pertaining to natural history (including geology and mineralogy) have been transferred thither, but they still form part of the British Museum. Externally this building is somewhat heavy in character, but the interior has been treated in a most artistic manner. The British Museum is under the management of 48 trustees, among the chief being the Archbishop of Canterbury, the lord-chancellor, and the speaker of the House of Commons. In all the staff of the institution numbers over 320 persons. The museum is open daily, free of charge. Admission to the reading-room as a regular reader is by ticket, procurable on application to the chief librarian, there being certain simple conditions attached. In 1900 there were 198,566 persons using the reading-room, and 689,249 visitors in addition. The institution contains something like 2,000,000 volumes in the department of printed books. A copy of every book, pamphlet, newspaper, piece of music, etc., published anywhere in British territory, must be conveyed free of charge to the British Museum. There are various catalogues and hand-books prepared by the officers of the museum, and containing classified descriptions of the contents of the different departments. Of these there are eight, namely, the department of (1) printed books, maps, charts, plans, etc.; (2) of manuscripts; (3) of natural history; (4) of Oriental antiquities; (5) of Greek and Roman antiquities; (6) of coins and medals; (7) of British and mediæval antiquities and ethnography; (8) of prints and drawings.

BRITISH SOMALILAND: a territory on the west coast of Africa under the protection of Great Britain, lying along the Gulf of Aden from about lon. 43° to 49° E., and extending from about lat. 11° to 8° N. On the e. and s.e. it is bounded by Italian Somaliland, on the s. and w. by Abyssinia, and on the n.w. by French Somaliland. It has an area estimated at nearly 70,000 sq. m., lacking in fertility largely on account of a lack of natural irrigation. The surface is in great part mountainous. The climate is more healthful in the interior than along the coast where there is more dampness. Among the chief products are sheep, cattle, skins, ostrich feathers, myrrh, and incense. The principal ports are Bulhor, Zeyla, and Berbera. The latter, which is the capital, has a good harbor and is in winter the scene of considerable commercial activity. The combined imports and exports are valued at about $2,500,000. The protectorate, created in 1884, is administered by a consul-general under control of the Crown. In 1894 the boundary between this protectorate and Italian Somaliland was defined. In the spring of 1903 an agitation in this region in favor of the Mad Mullah (q.v.), led to a considerable loss among

the British troops and their withdrawal in April. The inhabitants are related to the Abyssinians and Gallas, and on account of their nomadic habits there are no accurate statistics of population.

BRITISH SOUTH AFRICA COMPANY: a corporation established in 1889, with a royal charter, by Cecil Rhodes and others, for the purpose of controlling, settling, administering and opening up by railways and telegraphs, etc., certain districts in Central South Africa. Mashonaland was first settled, and, in 1893, Matabeleland was annexed and settled after the defeat of King Lobengula. In 1895, North Zambesia, in British Central Africa, was added, as well as a strip of territory in the Bechuanaland Protectorate. This territory has been called Rhodesia, or British Zambesia; area, about 500,000 sq. m. In consequence of the filibustering raid of Dr. Jameson, an officer of the company, near the close of 1895, Rhodes resigned his connection with the company in 1896, and a joint administrator of the territory was appointed by the British crown. See RHODESIA.

BRITISH WEST INDIES: see WEST INDIES.

BRITTANY: see BRETAGNE.

BRITTLE, a. *brĭt'tl* [AS. *brytan;* Icel. *briota;* Dan. *bryde,* to break; Gael. *briste,* broken]: easily broken; not tough. BRIT'TLENESS, n. *-nĕs,* the quality of being easily broken into fragments; want of tenacity. BRITTLE-WORTS, a genus of fresh-water plants, called *Chăra,* ord. *Charācĕæ,* some of which are rendered brittle by having their stems incrusted with carbonate of lime. BRITTLE-STARS, star-fishes, marine creatures with five rays or arms very fragile; the *Ophiuroidea.*

BRITTLE STAR, also called SNAKE STAR, and SAND STAR: a member of the order of *Ophiurida,* class *Asteroidea,* of the phylum *Echinodermata* (q.v.). It is characterized by the body forming a flattened disk, with cylindrical arms, the stomach not extending into the arms, and there is no intestine or anal opening. The ambulacral furrow is covered by the ventral shields of the tegument, so that the ambulacral feet project from the sides of the arm. It moves faster than the true star-fish, the arms being more slender and flexible. An ophiuran which has accidentally lost an arm can reproduce it by budding. In species of *Ophiothela* and *Ophiactis* the body divides in two spontaneously, having three arms on one side and two on the other, while the disk looks as if it had been cut in two by a knife, and three new arms had then grown out from the cut side.

Our most common brittle star is *Ophiopholis aculeata,* which may be found at low-water mark, and especially among the roots of Laminaria thrown upon the beach. It is variable in color, but beautifully spotted with pale brown, its general hue being a brick-red. Ophiurans

are widely distributed, and live at depths between low-water mark and 2,000 fathoms.

BRIT'TON, JOHN: topographical and antiquarian writer; b. 1771, July 7, at Kingston-St.-Michael, near Chippenham, Wiltshire, Eng.; son of a farmer and village shopkeeper. Losing his parents in early years, he received but a scanty education. Some short notices which he contributed to the *Sporting Magazine* brought him into acquaintance with its publisher, Wheble, who employed him to compile the *Beauties of Wiltshire,* which he did in conjunction with a young literary friend, E. W. Brayley. They also prepared the *Beauties of Bedfordshire* in the same manner. Britton afterward issued a more elaborate work, *Architectural Antiquities of England.* One of the most important of his subsequent publications was *The Cathedral Antiquities of England,* 14 vols., fol. and 4to, 1814–35, with upward of 300 highly finished plates. Altogether, his illustrated works of architectural and topographical description and antiquities number 87, besides others of a similar kind which he edited.

BRITZSKA, n. *brĭts'kă* [Russ. *britshka*]: a long open carriage that can be closed at pleasure.

BRIVE, *bre-vā'*: town of France, dept. of Corrèze, pleasantly situated in the midst of vineyards, and shut in by a fine circular avenue of elms; about 15 m. s.w. of Tulle. It has manufactures of woolen, cotton-yarn, etc. Pop. 12,000.

BRIXHAM, *brĭks'am:* market-town and seaport of Devonshire, Eng., beautifully situated on the s. side of Tor Bay, 5 m. s. from Torquay, 22 m. s. from Exeter. The town occupies the sides of two hills, and is divided into two parts, Upper and Lower Brixham, the former consisting chiefly of a long straggling street. Some more recently erected parts of the town are well built, and contain good houses, but the older parts are mean. The prosperity of Brixham depends chiefly on its fisheries, it being the head-quarters of the great Devonshire fishery of Torbay, in which many vessels are employed, mostly trawlers, of which there are about 200. These are decked sloops of 40 to 50 tons burden, managed usually by three men and a boy. Great quantities of fresh fish are sent to London, Bath, and Bristol. Considerable quantities of iron ore are raised in the neighborhood and shipped here. Brixham has also a number of vessels in the coasting and foreign trade, the foreign trade chiefly with the Mediterranean. The admiralty have an establishment here for watering the navy. Near Brixham is a station of the South Devon branch of the Great Western railway. It was at Brixham that the Prince of Orange, afterward William III., landed, 1688, Nov. 4. Pop. of parish (1903) 8,100.

BRIZA: see QUAKING GRASS.

BRIZE, n. *brēz:* same as BREEZE, the insect.

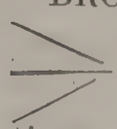
BRIZURE, *briz'ūr*, or BRIZÉ or BRISÉ: *bre-sā:* terms in heraldry to indicate that a charge is bruised or broken. See ROMPU.

BROACH, n. *brōch* [F. *broche*, a spit—from mid. L. *broccæ*, a sharp stake, a needle: compare W. *procio*, to thrust; Gael. *brog*, to goad]: a sharp-pointed stake; a peg or pin; a spit; a spire which rises directly from a tower without a parapet; common in England and in parts of Scotland, also in the United States; sometimes spelled *broche:* V. to pierce as with a spit; to tap, as a cask, in order to draw off the liquor; to let out; to utter; to make public. BROACH'ING, imp. BROACHED, pp. *brōcht.* BROACH'ER, n. a spit; one who opens or utters. TO BROACH TO, among *seamen*, to incline a vessel suddenly to windward so as to expose it to the danger of oversetting. TO BROACH A SUBJECT, to open it up for consideration; to give publicity to it.

BROACH: town in India: see BAROACH.

BROAD, a. *brawd* [AS. *brâd:* Goth. *braids:* Icel. *breidr:* Ger. *breit*]: wide; not narrow; extensive; open; coarse; not delicate; in *OE.*, bold. BROAD'LY, ad. *-lĭ.* BREADTH, n. *brĕdth.* BROAD'NESS, n. the quality of being broad; extent from side to side; coarseness in speech. BROAD'CAST, a. thrown from the hand upon the earth as in sowing; not planted in rows; a method usually deemed inferior to sowing by the drill: Ad. by scattering or throwing as from the hand. BROAD-ARROW [see ARROW]: the mark placed on government stores, etc. BROAD-AX, an ax with a broad edge. BROAD-BRIM, a hat with a broad brim; by metonomy, a Quaker, from the broad-brimmed hats worn by them. BROADCLOTH, fine woolen cloth, double the usual width (see WOOLEN and WORSTED MANUFACTURES). BROAD-LEAF, a tree, *Terminalia latifolia*, a native of Jamaica. The wood is used for staves, scantlings, and shingles. It is sometimes mistaken for the almond-tree, from the similarity of its fruit. BROAD-SEAL, the great seal of England. BROAD GAUGE, in *railways*, the width of 6 or 7 ft. between the rails, as distinguished from the narrow gauge of 4 ft. 8½ in. BROADSHEET, a large printed loose sheet containing songs, narratives of current events, and the like, *formerly* sold by itinerant dealers; *now*, often applied to newspapers. BROADSIDE, the side of a ship above the water-line; in a war-ship, all the guns on one side discharged at once; a sweeping invective; a large sheet of paper printed on one side. BROADSWORD, a sword with a broad blade; the claymore of the Highlanders (see CLAYMORE). BROAD-WISE, in the direction of the breadth. BROADEN, v. *brawd'n*, to make or grow broad. BROADENING, imp. *brawd'nĭng.* BROADENED, pp. *brawd'ĕnd.* BROAD AS LONG, the same measure in length as in breadth; much the same; equal; making no difference. TO TAKE ON THE BROADSIDE, to

attack boldly and unceremoniously. BROAD CHURCH, a party in the Church of England avowedly holding a position between high and low church parties, professing moderate and liberal views, and a wide charity and toleration; many distinguished men are of this division, such as Canon Kingsley, Dean Stanley, F. W. Maurice, Archdeacon Farrar. The term stands not for any recognized organization; but for a drift of thought.—SYN. of 'broad:' large; thick; ample; wide; extensive; comprehensive; vast; vulgar; coarse; obscene.

BROAD ARROW: a British government mark,  stamped, cut, or otherwise fixed on all solid materials used on ships or dock-yards, and on government stores generally, to prevent misappropriation. The origin of the mark is obscure. Previous to 1698, the naval authorities prosecuted a dealer in marine-stores, for having in his possession certain stores bearing the Broad Arrow of his majesty. The defendant allowed the evidence against him to go on, and when asked what he had to say, replied, that it was *very curious* that the king and he, as a dealer, should both have the same private mark on their property! The receiver of stolen goods was acquitted, and this led to the passing of the act (1698), which enacts that persons in possession of naval stores, or goods of any kind marked with the Broad Arrow, or other marks therein mentioned, and usually employed in marking naval stores for the navy, shall forfeit all such goods and £200, and also pay costs. The mark is for iron, wood, etc., what the color-thread is for sailcloth and ropes, which enables the government to identify the smallest piece of such articles.

BROAD-BILL: see SHOVELLER.

BROAD-BOTTOM ADMINISTRATION: name derisively applied to the ministry formed by Henry Pelham 1744, because it professed to include all parties of weight and influence in the state in a grand coalition, and comprised no less than nine dukes. Thus for a time the whig party was reunited, and even tory support secured. The ministry was dissolved, 1754, by the death of Pelham, though several of its original members had seceded long before.

BROAD RIVER: rising in the Blue Ridge in Rutherford co., N. C., and flowing almost directly s. to Columbia, S. C., where it joins the Saluda, thence flowing s.e. into the Congaree, which empties into the Santee. The country around B. R. is exceedingly fertile.

BROAD'SIDE: simultaneous discharge of all the guns on one side of a ship of war. The fighting power of a ship used to be estimated by the weight of all the shot and shell that could be fired off at once from one side or half of the ship. Thus, the broadside of the old-fashioned *Duke of Wellington*, 131-gun war-steamer,

amounted to 2,400 lbs. With iron-clad turret-ships the term is inapplicable.

BROAD'STAIRS: quiet watering place in Kent, 2 m. e.n.e of Ramsgate. The church dates from the 12th c. Near B. is a noble orphanage.

BROAD TOP MOUNTAIN: in the n.e. of Bedford co., and the s. of Huntingdon co., Penn.; about 2,500 ft. above the level of the sea. Here are extensive beds of bituminous coal, for the transportation of which a railroad has been opened from the mountain to Huntingdon.

BROADUS, *brôd'us*, JOHN ALBERT, D.D., LL.D.: Baptist minister: 1827, Jan. 24—1895, Mar. 16; b. in Culpepper co., Va. Was of Welsh extraction, the name being originally spelled Brodhurst, and was the son of a leading Virginia politician. He graduated at the Univ. of Virginia, 1850, with the degree of A.M., and the following year was appointed asst. prof. of Latin and Greek in that university. This position he held for two years, during which time he was also pastor of the Bapt. church at Charlottesville, Va. He was chaplain of the univ. 1855–6, and then resumed his pastorate at Charlottesville. In 1859, he joined with the Rev. James P. Boyce in organizing the Southern Bapt. theol. seminary at Greenville, S. C., which opened with four professors and 26 students. The instructors were Drs. James P. Boyce, Basil Manly, William Williamson, and Dr. Broadus, who filled the chair of homiletics and New Testament interpretation. During the civil war, he served as missionary chaplain in the confederate army of Gen. Lee. In 1863, he was made corresponding sec. of the Southern Bapt. S.-S. board. In 1865, the Southern Bapt. theol. seminary reopened with seven students. From Greenville the seminary was removed to Louisville, Ky., whither Dr. Broadus removed his residence 1877. In 1889, after the death of Dr. Boyce, he was elected to the presidency of the seminary. Among his numerous published writings are: *The Preparation and Delivery of Sermons* (used as a textbook in the majority of theol. seminaries of all denominations in America and Europe); *Memoir of James P. Boyce, D.D., LL.D.; Commentary on the Gospel according to Matthew;* and *Jesus of Nazareth.* He wrote extensively also for periodicals, and published a number of tracts. As a teacher and lecturer he was singularly successful; as a preacher he was as easily understood by children as by adults, and ranked among the ablest preachers of his generation.

BROAD'WOOD, JOHN: English pianoforte manufacturer: b. Cockburnspath, Scotland, 1732; d. 1812. Going to London, he entered into partnership with a Swiss maker of harpsichords, named Burkhardt Tschudi, the firm being known as Tschudi & Broadwood. In 1769 his partner retired, and on his death four years later

his son became a partner with Broadwood; but from 1783 till 1795, when Broadwood's son entered into partnership with him, he had the sole control of the business. The firm has long been known as John Broadwood & Sons. By the skill of Broadwood and those associated with him many improvements were introduced in the construction of the pianoforte, and for a long time the history of the firm was practically the story of the progressive development of that instrument.

BROBDINGNAGGIAN, *brŏb-dĭng-năg'gĭ-an*, or BROBDINGNAGIAN, a. *brŏb-dĭng-nā'jĭ-an:* gigantic in person, like an inhabitant of *Brobdingnag* in *Gulliver's Travels:* N. a gigantic person or thing.

BROCA, *bro-kâ'*, PAUL: 1824–80, July 9; b. in the Gironde, Fr.: eminent modern anthropologist. He studied medicine and became prof. of pathology at Paris, and famous as a surgeon. He was founder and sec. of the Anthropological Soc. of Paris, founder and prof. of the Anthropological Institute or School, and founder and editor of the *Anthropological Review*. He wrote several monographs, as on strangulation and hernia, on aneurisms, on anæsthesia, on abscesses, on hybrids, and on various anthropological subjects. He was leader of the evolutionist school in France. In the last years of his life, he was made a life member of the senate.

BROCADE, n. *brō-kād'* [Sp. *brocado;* It. *broccato*, a sort of cloth wrought with gold or silver: F. *brocher*, to stitch or embroider; *brochart*, brocade]: silken fabric woven with variegated gold and silver threads, and raised flowers, the figures being formed by the threads of the warp or weft being raised by the heddles, or more generally, by the Jacquard-loom, in such order as to produce the pattern required. The word has much the same application to silk textures that damask has to linen textures or to worsted textures for upholstery uses (see WEAVING: JACQUARD-LOOM); any sort of stuff or cloth which has raised flowers or other work embroidered on its surface. BROCA'DED, a. woven with figures, etc.

BROCAGE, n. *brō'kāj*. OE. for BROKERAGE: the transactions of a broker; the gains obtained from such; the hire or gain obtained from mean and base transactions. Brocage bonds to procure marriage, promising a reward for influence to be used, are void by law in some countries.

BROCARD, n. *brŏk'ârd* [after *Brocard* or *Burchard*, Bishop of Worms, who compiled books of 'sentences']: an elementary principle or maxim; a proverbial rule in law, ethics, or metaphysics.

BROCATELLO, n. *brŏkă-tĕl'lō* [It. *brocatello:* Sp. *brocatel*, marble]: a species of brecciated marble, the

component fragments of which are of various colors; a coarse-figured fabric.

BROCCOLI, n. *brŏk'kō-lĭ* [It. *broccoli*, sprouts or tops growing from cabbages—from *brocco*, a sprout: F. *brocoli*: one of the many varieties which cultivation has produced of the *Brassica oleracea*, the common kale or cabbage; ord. *Cruciferæ*. The food portion is the fleshy edible head formed from the condensed young inflorescence. B. is said to have been originally brought to Italy from Cyprus about the middle of the 16th c. It differs little from cauliflower (q.v.), having colored instead of white heads, and a deeper tinge of color in the leaves, being also more hardy, which gives it its chief importance, as it can be obtained at seasons when there is no cauliflower in the open garden. It is perhaps inferior to cauliflower in delicacy of flavor. There are many subvarieties, the number of which is continually increasing; and some of these are preferred for early spring sowing, with a view to an autumn crop; others for later sowing, with a view to a crop in the following spring. The subvarieties differ in size, in their more cut or entire leaves, in the greater or less degree of color—generally purple—with which the leaves are tinged, in the more or less compact form of the whole plant, in the more or less green, yellow, or purple color of the head, etc. Some of the kinds of B. preferred for late sowing and spring use are known by the general name of Cape Broccoli, the first of them being said—but on doubtful authority—to have been introduced into Britain from the Cape of Good Hope. The mode of cultivation of B. resembles that of cauliflower, except as to the times of sowing and transplanting, and that it is generally sown in the open ground, and not in a hotbed. A similar richness of soil is required. Various modes of protection in winter are adopted. In mild winters, protection is scarcely or not at all needed, but precautions are generally employed against severe weather. It is found very advantageous to plant in trenches of 6 inches deep, and to earth up the plants, as they are thus not only in some measure preserved from frosts, but also from the winds of winter, which are apt to shake and loosen plants, so as to cause their destruction. It is a common practice to take up some of the most advanced plants in the beginning of winter, and to lay them in a sloping position with their heads toward the north. The heads may thus be procured, but they are not in general large.

BROCHÉ, n. *brō-shā'* [F.] a figured or embossed cloth fabric.

BROCHS, also called *Duns*, *Borgs*, and Pictish Towers: see MOUSA.

BROCHURE, n. *brō-shôr'* [F. *brochure*—from *brocher*,

to stitch]: a pamphlet; a small book of only a few leaves: see PAMPHLET.

BROCK, n. *brŏk* [AS. and Gael. *broc*, a badger—from Gael. *breac*, spotted, freckled]: a badger—so named from its white-streaked face. BROCKET, *n. brŏk'ĕt*, in Scot., variegated; spotted; striped; white-faced.

BROCK, Sir ISAAC: English general, killed in the battle of Queenston, Can., 1812, Oct. 11, shortly after capturing Gen. Hull (who was suspected of treason) and his forces. B.'s monument, crowning the heights above Queenston, is 185 ft. high, surmounted by a dome of 9 ft., reached by a spiral flight of 250 steps inside. The remains of Brock, and his aid-de-camp MacDonnell, who fell with him, lie in stone sarcophagi beneath, having been removed thither from Fort George. This is the second monument erected on the spot, the first having been destroyed 1840.

BROCKEN, *brŏk'ĕn* (*Mons Bructerus, Melibocus* of the ancient Romans): popularly known as the *Blocksberg*, the highest summit of the Harz Mountains. It is in the province of Saxony, about 20 m. w.s.w. of Halberstadt, and is 3,740 ft. above the sea. The mountain is very frequently veiled in mist and cloud-strata, and is celebrated for the phenomenon known as the *Brockengespenst* ('Spectre of the Brocken'), which is merely the magnified shadow of men, houses, or other objects thrown upon the misty eastern horizon by the light of sunset. In clear weather, a fine view is obtained from the summit.

BROCKET, n. *brŏk'ĕt* [F. *brocart*—from *broche*, a sharp snag]: a two-year-old red-deer, having a single sharp snag to his antler.

BROCKHAUS, *brŏk hows*, FRIEDRICH ARNOLD: 1772, May 4—1823, Aug. 20; b. Dortmund, Ger.: founder of the well-known firm of Brockhaus in Leipsic, publisher of the *Conversations-Lexicon*. A business venture in Holland 1802–10 did not prosper; he returned to Germany, and commenced business in Altenburg 1811. Before this, however (in 1808), B. had purchased the copyright of the *Conversations-Lexicon*, which had been commenced in 1796, and he completed the first edition with the addition of two supplementary vols., 1809–10. In 1812, a second improved edition of the work was begun under the supervision of Brockhaus as editor. The peace of 1815 enabled Brockhaus to pursue prosperously his career. In 1817 his business had so increased, that he left Altenburg for Leipsic, where, in the following year he began book-printing in addition to book-publishing. In the course of a few years, the *Lexicon* passed through six editions; it has now arrived at the thirteenth edition. Through all the enterprises of Brockhaus as a publisher, devotion to liberty and general enlightenment may be traced. Brockhaus was not only an

able and assiduous man of business, but distinguished for literary culture, knowledge of the world, and numerous social accomplishments. The business was afterward carried on by HEINRICH BROCKHAUS, 1804–74, second son of Friedrich Arnold Brockhaus, and is now managed by Heinrich's sons, Rudolf and Edward. Among the numerous publications issued by the house, are the later editions of the *Conversations-Lexicon*, with an *Atlas;* the *Universal Encyclopædia*, by Ersch and Gruber; and the German *Penny Magazine*, founded 1833.

BROCKHAUS, HERMANN: 1806, Jan. 28—1877; b. Amsterdam; third son of Friedrich Arnold B.: studied at Leipsic, Göttingen, and Bonn, and lived successively in Copenhagen, Paris, London and Oxford. From 1848 till his death, he held at Leipsic the chair of ordinary prof. of the Sanskrit language and literature. Among his works on Oriental literature are, the *First Five Books of the Large Collection of Fables, Kathâ Sarit Sâgara, in Sanskrit and German* (1839); an edition of the drama *Prabodha Candrodaya*, by Krishna Misra, with Hindu scholia (1845); Nachschebi's Persian version of the *Seven Wise Masters* (1845); and (1854) the Persian text of the *Songs of Hafiz*. After 1856, he was editor of the *Universal Encyclopædia*. B.'s method of printing Sanskrit in Roman types is now generally adopted in Germany.

BROCKPORT, *brŏk'port*, post village, Monroe co., N. Y., on the Erie canal, 18 m. w. of Rochester, 59 m. e. of Niagara Falls by the N. Y. Central and Hudson River railroad. It is noted for its manufacture of pumps, reapers, and mowers, flour, lumber, etc. It is the seat of the State Normal School, and is in the midst of a productive agricultural region. Pop. (1890) 3,742; (1900) 3,398; (1910) 3,579.

BROCKTON, *brŏk'tŭn*, Mass., a city in Plymouth County, situated on the N. Y., N. H. & H. R.R.; 20 m. south of Boston. It is one of the largest boot- and shoe-manufacturing places in the country, and beside these articles has extensive manufactories of rubber goods, shoe machinery and supplies, tools, and bicycles. It contains the villages of Campello, Montello, Marshall's Corner, Brockton Heights, Clifton Heights, and Salisbury Square. It was settled in 1700, was incorporated as a town in 1821, and chartered as a city in 1881. There are two national and two savings banks, a public library, with over 26,000 volumes; public school property valued at over $500,000; and a property valuation exceeding $26,000,000. Pop. (1910) 56,878.

BROCKVILLE, *brŏk'vĭl*, Canada, port of entry, and the chief town of the united counties of Leeds and Grenville, Ontario, on the Saint Lawrence River below the Thousand Islands and on the Grand Trunk Railway. It is 125 m. by rail south of Montreal and 40 m.

by water below Kingston and is a terminus of the Canadian Pacific Railway, and of the Brockville, Western & Sault Ste. Marie Railway. It is a port for the Saint Lawrence steamers and is connected by ferry with Morristown, New York State. Brockville is lighted by gas and electricity and has excellent sewerage systems. It has numerous churches and public buildings, a collegiate institute, 4 public schools, 1 separate school, a manual training school and an art school, The manufactures comprise stoves, carriages, agricultural implements, hats, cigars, chemicals, lumber, flour, gloves, tools, machinery and foundry products. It is named after General Sir Isaac Brock (q.v.). Pop. (1907) 10,000.

BROCKWAY, *brŏk'wā,* ZEBULON REED, American penologist: b. Lyme, Conn., 1827, April 28. His connection with prison administration began at the Connecticut State Prison. He was connected successively with the penitentiaries of Albany and Monroe counties, N. Y., and with the House of Correction, Detroit, Mich. He is best known in connection with the penal-reform methods introduced during his superintendency of the New York State Reformatory at Elmira, a position which he filled from 1876–1900. He has written numerous papers and magazine articles on penology.

BRODEKIN, n. *brōd'kĭn* [F. *brodequin*]: a buskin or half boot.

BRODERICK, *brŏd'rĭk,* DAVID COLBRETH, American legislator; b. Washington, D. C., 1820, Feb. 4; d. Lake Merced, Cal., 1859, Sept. 16. He was defeated for Congress in New York in 1846; went to California, and was elected a member of the Constitutional Convention of 1849; served as speaker of the Senate; and was elected to the United States Senate in 1856, where he opposed the admission of Kansas.

BRODERIP, *brŏd'rĭp,* WILLIAM JOHN, English naturalist: b. Bristol, 1789, Nov. 21: d. London, 1859, Feb. 27. He graduated from Oriel College, Oxford, in 1812; studied law, and was called to the bar in 1817; and subsequently occupied several legal posts. In 1851 he became treasurer of Gray's Inn, with which office was combined that of librarian. He was an enthusiastic naturalist, and made many fine collections, his conchological cabinet being purchased for the British Museum. In 1847 he published *Zoological Recreations,* and five years later appeared *Leaves from the Note-Book of a Naturalist.*

BRODEUR, LOUIS PHILIPPE, Canadian statesman: b. Beloeil, Quebec, 1862, Aug. 21. He was educated at the College of St. Hyacinth and Laval University; was called to the bar in 1884; became King's Counsel in 1899; and editor of *Le Soir* in 1896. He was elected to the House of Commons for Rouville in 1891, 1896,

1900 and 1904; was deputy speaker of the House from 1896–1900 and speaker from 1900–4; and since 1904 has been Minister of Inland Revenue.

BRODHEAD, JOHN ROMEYN, LL.D: b. Philadelphia, 1814, Jan. 2; d. New York, 1873, May 6. He graduated from Rutgers College 1831, and after studying law in the office of Hugh Maxwell was admitted to the bar 1835. He practiced in New York two years, when he retired to Saugerties, N. Y., and engaged in literary pursuits. In 1839 he was attached to the U. S. Legation at the Hague, and two years later was commissioned by Gov. Seward to investigate the originals of the New York colonial records and land grants. He accordingly spent three years studying the archives of Holland, England and France, from which he obtained many valuable documents regarding the early history of the State, translated and edited by E. B. O'Callaghan, and published in 11 quarto vols. by an act of the N. Y. legislature. In 1846 B. was appointed sec. of legation in England, Mr. Bancroft being minister. Returning to America 1849, he was appointed naval officer of the port of New York during Pierce's administration. He wrote *History of the State of New York*, 2 vols. (1853–71). He also delivered numerous addresses before literary and learned societies, afterward published.

BRODIÆA, *brō-dĭ-ē'a*, a small genus of western America corm-rooted plants of the natural order *Liliaceæ*, which are popular as garden flowers. The species are of low growth, and have several purple, red, white, or yellow funnel-shaped flowers on a scape. According to some authors several related genera are grouped in this, and cultural methods vary in consequence. For list of species and cultural directions consult: Bailey and Miller, *Cyclopedia of American Horticulture* (N. Y. 1900–02).

BRODIE, *brō'dĭ*, SIR BENJAMIN COLLINS, D.C.L., Bart.: surgeon: 1783–1862; third son of the Rev. Peter Bellinger Brodie, rector of Winterslow, Wiltshire, Eng. He studied under Sir Everard Home at St. George's Hospital, to which he was, 1808, elected asst.-surgeon, and afterward surgeon. He had previously lectured both on anatomy and on surgery. In 1810, he was elected a fellow of the Royal Soc., and in 1811 received their Copley medal for his physiological papers contributed to the *Philosophical Transactions*. In 1834 he was created a baronet, and he held the appointment of serjeant-surgeon to Queen Victoria, as well as that of first surgeon in ordinary to the Prince Consort. He was pres. of the Royal Soc., a corresponding member of the Institute of France, and a foreign member of other learned societies and academies in Europe and America; author of *Lectures on Local Nervous Affections* (1837, 8vo);

Hunterian Oration, (1837); *Lectures Illustrative of Subjects in Pathology and Surgery* (1840, 8vo); *Introductory Discourse on the Duties and Conduct of Medical Students* (1843, 8vo); *Psychological Inquiries as to Mental Faculties* (3d ed., 1856); an edition of his works with *Autobiography* appeared 1865. He also contributed to several scientific journals.

BRODRICK, *brŏd'rĭk,* GEORGE CHARLES, English educator: b. Castle Rising, Norfolk, England, 1831, May 5. He was educated at Eton and Balliol College, Oxford, and University of London. He was called to the bar in 1859. From 1877–9 he was a member of the London school Board. In 1881 he became warden of Merton College. Among his works are: *Political Studies; English Land and English Landlords; Memorials of Merton College; Short History of Oxford University;* and *Memories and Impressions.*

BRODRICK, WILLIAM ST. JOHN FREEMANTLE, English statesman; b. 1856, Dec. 14. He was educated at Eton and at Balliol College, Oxford. From 1880–5 he was member of Parliament for West Surrey; 1886–92, financial secretary to the war office; 1895–8, under-secretary of state for war; 1898–1900 under-secretary of state for foreign affairs; 1900–3 secretary for war.

BROD'SKY, *brŏd'skĭ,* ADOLF, Russian violinist: b. Taganrog, South Russia, 1851, Feb. 21. He first played in public at the age of nine, and later went to Vienna to pursue his musical studies. In 1879 he became director of the symphony concerts in Kieff, and later held a professorship in the Leipsic Conservatory. As a soloist he appeared in concerts in several of the leading cities of Europe. He came to the United States and taught for a time in Scharwenka's Conservatory, New York, but returned to Leipsic. In 1895, he was made director of the Royal College of Music, Manchester, England.

BRO'DY, *brō'dĭ,* Austria, a town in Galicia, near the Russian frontier, 58 m. east-northeast of Lemberg, on a swampy plain. It has broad streets, houses mostly built of stone, an old castle, three churches, Jewish synagogue, etc. About two-thirds of its inhabitants are Jews, who have a hospital for themselves and a college for the instruction of artists and mechanics. The commerce, carried on prinicpally by Jews, is important, the town being favorably situated for the interchange of goods between Austria and Russia, and Turkey. Pop. about 20,000.

BROG, n. *brŏg:* a pointed steel instrument used by joiners to make holes in wood for nails; a brad-awl: V. to pierce; to stab; to prod.

BROGAN, n. *brō'găn,* or BROGUE, or BROG, n. *brōg* [Gael. *brog,* a shoe; *brogan,* a little shoe—from *brogh,* strong, sturdy, rough]: a coarse, light, low-heeled kind

of shoe, formerly in use among the aboriginal Irish and the Scottish Highlanders (see SHOES: SHOE-TRADE); a heavy shoe having the sole studded with nails, especially of half-dressed leather; shoes consisting of wooden soles, and uppers; a clog; a modern fanciful shoe. BROGUE, n. a dialect or peculiar manner of pronunciation, as Irish *brogue*.

BROGLIE, *brō-lē*, a family distinguished in the annals of French wars and diplomacy, which derives its origin from Piedmont. Among its members are:

1. FRANÇOIS MARIE, DUC DE, French soldier: b. Paris, 1671, Jan. 11; d. Ferrières, 1745, May 22. From 1689 he fought with distinction in the Netherlands, Germany, and Italy. He was also employed in diplomatic affairs, and concluded a treaty between France, England and Prussia in 1725. He rose by degrees till in 1734 he became marshal of France. In the war of the Austrian succession he had the chief command of the armies in Bavaria and Bohemia.

2. VICTOR FRANÇOIS, DUC DE, French soldier: b. (the eldest son of the preceding) 1718, Oct. 19; d. Münster, 1804. He commenced his career under his father in the battles of Guastalla and Parma (1734); was engaged in all the wars of France, and was created marshal in 1759. Jomini considered him the only French general who had shown constant ability during the Seven Years' War. He was engaged in the battles of Hastenbeck, Rossbach, Sondershausen, and Lützelberg, and, being appointed to the chief command, defeated the Prussians and Hessians at Bergen in 1759, for which Francis I. of Austria created him a prince of the empire. In 1760 he gained another victory at Corbach, but was defeated, together with the Prince of Soubise, at Willingshausen, in the following year. In consequence of this and the favor of Soubise at court he was exiled. He was recalled in 1764, and in 1789, when the Revolution broke out, Louis XVI. appointed him minister of war; at the same time he received the command of the troops that were to keep Paris in check. The desertion of the National Guard rendered all his efforts vain, and Broglie left France. In the campaign of 1792 he commanded a division of the *émigrés* without success. After its close he withdrew entirely from public life.

3. VICTOR CLAUDE, PRINCE DE BROGLIE, French soldier: b. (third son of the preceding), 1757; d. Paris, 1794, June 27. He entered at first into the views of the revolutionary party. He was deputy of the nobility of Colmar to the States-General in 1789. After the dissolution of the Constituent Assembly he was appointed field-marshal in the army of the Rhine, but upon his refusal to acknowledge the decree of August 10, suspending the royal authority, was deprived of his command,

summoned before the revolutionary tribunal, and led to the guillotine.

4. Achille Charles Léonce Victor, Duc de, French statesman: b. Paris (son of the preceding), 1785, Dec. 1; d. Paris, 1870, Jan. 25. In 1816 he married a daughter of Madame de Staël and was made a member of the chamber of peers. After the Revolution of 1830 the Duc de Broglie and Guizot were the heads of the party known as *doctrinaires.* He was minister of public instruction for a short time in 1830, and minister of foreign affairs from 1832, October to 1834, April. In 1849 he was a conservative member of the Legislative Assembly, and after the *coup d'état* he continued a bitter enemy of the imperial régime. His later years were devoted to philosophical and literary pursuits.

5. Jacques Victor Albert, Duc de: b. Paris (son of the preceding), 1821, June 13; d. 1901. In 1846 he became secretary to the embassy at Madrid, whence he was transferred to that at Rome, but the revolution of 1848 caused him to give up public life. From that time he became known as an able writer in political reviews. In 1856 he published *L'Histoire de l'Eglise et de l'Empire,* in six volumes, a work which gained him a chair in the Academy. In 1871 he was elected to the National Assembly for the department of Eure, and in the same year became ambassador at London. He led the opposition to Thiers during 1872–3, and finally succeeded in defeating him. In the latter year he became minister of foreign affairs and president of the council, but in 1874 he suffered defeat. In 1885 he again gave up political life and devoted himself to his historical studies. Among his works are: *Le Secret du Roi Louis XV.* (1878); *Fréderic II. et Marie-Thérèse* (1883); *Maurice de Saxe et le Marquis d'Argenson* (1891); *La Paix d'Aix-la-Chapelle* (1892); *Le Père Lacordaire* (1895); *Malherbe* (1897); etc.

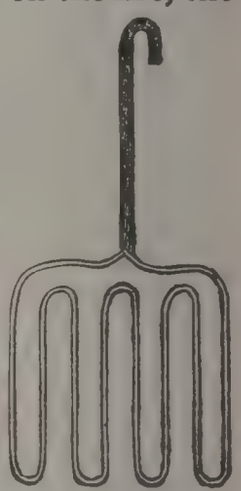
BROID, n. *broyd:* in OE., see Braid; Embroidery.

BROIL, n. *broyl* [F. *brouiller,* to jumble or mix: It. *broglio;* Gael. *broighlich,* noise, confusion]: a jumbled noisy quarrel; a tumult; discord.—Syn.: quarrel; difference; dispute; altercation; affray; fray; feud; contention; tumult; discord; dissension

BROIL, v. *broyl* [F. *brasiller,* to roast on the *braise* or glowing coals: Scot. *brissle and brulyie,* to parch or broil: F. *brûler;* OF. *brusler,* to parch, to burn—from It. *brustolare,* to scorch]: to parch or roast by exposure over the fire; to dress meat over a fire on a gridiron; to roast or grill; to be subjected to the action of great heat; to be in a great heat. Broil'ing, imp.: N. the process by which meat is roasted or cooked over a fire. Broiled, pp. *broyld:* Adj. cooked by broiling. Broil'er, n. one who; a chicken suitable for broiling (U. S.).

BROILING: convenient and expeditious mode of cooking small pieces of meat. Broiling is, in fact, a quicker sort of roasting. The albumen of the outside be-

ing sealed up at once, the nutritious juices of the meat are retained; therefore this process is much to be recommended. But to broil meat so as to preserve its flavor, juice, and fat, requires care. The meat should be prepared for the gridiron by being beaten slightly with a rolling-pin, trimmed of superfluous fat and skin, and cut so as to look well on the dish. The fire should be perfectly clear, and of a red-hot surface to answer to the size of the gridiron, that all parts of the meat may be equaly cooked. Just before setting the gridiron over, some salt should be sprinkled on the fire to prevent the flare. The gridiron should be perfectly clean and smooth, being always rubbed when it is put away; and, before using, it should be warmed, greased with suet, and rubbed again with paper. When it is placed on the fire, the back should be higher than the front. The meat should never be touched with a fork, but turned rapidly with the broiling tongs; and when sufficiently done, should be served immediately on a very hot dish, being seasoned according to taste. In large ranges there should be a broiling stove, and an apparatus for B. suited to it; by this the heat of the fire can be easily regulated. But for all ordinary purposes, a fire of charcoal, or of common coal, and a grooved gridiron, to preserve the gravy, is all that is necessary. Sometimes a gridiron is used to hang before the fire, when a dinner is being dressed and the top of the fire occupied; this is convenient, but it is an inferior way of cooking, the meat being roasted rather than broiled. There is a form of gridiron well adapted to small low fires, as it is easily put in between the bars (see fig.). B. *under* instead of over the fire is by many deemed a preferable method: it requires a gridiron on a low frame to lift it above the ashes and near the fire.



Gridiron.

BROKE, v. *brōk*, pt., BROKEN, pp. *brō′kn* [from BREAK, which see]. BRO′KEN, a. rent asunder; separated into fragments or pieces; rugged; uneven; infirm. BRO′KENLY, ad. *-lĭ*. BRO′KENNESS, n. *-kn-nĕs*, state of being broken. BROKEN-HEARTED, a. depressed or crushed by grief or despair. BROKEN-MEAT, the fragments or remains of meat or victuals. BROKEN-WINDED, a. having short breath or disordered respiration.

BROKE, v. *brōk* [F. *brocanter*, to deal in second-hand goods: mid. L. *brocam*, retail, as in *vendĕrĕ ad brocam*, to sell by retail: Dut. *brack*, damaged: Dan. *brug*, custom, trade: comp. Gael. *breug*, to flatter, to entice]: to transact business in behalf of others, or by means of others. BRO′KING, imp.: N. doing business as a broker: ADJ. pertaining to. BROKED, pp. *brōkt*. BROKER, n. *brō′kĕr*, a middle-man in trade transactions; one employed by merchants to buy and sell for them; one who deals in second-hand goods; a pander or go-between; one who engages in discreditable transactions. BRO′KERAGE, n. *-āj*, the fee, wages, or commission paid to

a broker for buying or selling for another. EXCHANGE-BROKER, one who deals in home and foreign money. STOCK-BROKER, one who buys and sells stocks for others. PAWN-BROKER, n. one who lends money at interest on goods left with him. INSURANCE-BROKER, an intermediate agent who secures for the owners from the underwriters or insurance offices, at a certain rate per cent. that the value of a ship and cargo shall be paid, if lost at sea. SHARE-BROKER, one who buys and sells shares.

BROKEN KNEES: an injury to the knee-joints of a horse, caused by a fall. The knee of the horse corresponds to the carpus or wrist of man, and from the peculiar conformation of a quadruped, is much exposed to serious injury by a fall; and even when the wounds are healed, the scar usually remains to indicate that the horse is 'broken-kneed' —thence unsafe, and deteriorated in value.

Causes.—The cause of the injurious fall is usually elsewhere than in the horse. As a rule, the safety of a horse's action is very great, particularly at the age of from four to seven or eight years. Rarely does a horse at any age fall on his knees, unless his feet have suffered from improper shoeing; the animal then moves cautiously, and is very apt to 'stumble.' Undoubtedly, a horse of defective conformation and sluggish disposition is more likely to stumble and fall than a well made, high-actioned steed; nevertheless, the most perfect animal may gradually be rendered unsafe by improper shoeing: see SHOEING OF HORSES.

Symptoms.—It is important, as soon as the injury is done, to determine the extent and depth of the wound. If it be merely a superficial wound, the case is a simple one; and unless the skin is much bruised, the hair will grow, and the animal not be permanently blemished. The sheath, however, through which the tendon over the joint passes, may be opened, and the tendon itself injured. The wound is then gaping, heals rather slowly, and sloughs have to be thrown off. Lastly, the joint itself may be opened, and this is indicated by a free discharge of the joint-oil or synovia, and by the bones being seen or felt on probing. The worst form of accident is when the bones of the joint are fractured. The system suffers when the wounds are serious, and severe fever sets in.

Treatment.—Whatever may be the form of injury, the first injunction is to wash the wound thoroughly with cold water applied constantly for hours. The joint will swell, become hot and painful, and in some cases irritative fever occurs. Then the animal should be kept on low diet, and be purged with four, five, or six drachms of aloes, according to its size, etc. Should the wound be deep, much dirt remaining in the tissues, a large linseed-meal poultice should be applied over the joint for a day or two, until free suppuration sets in. If this is retarded, and in all cases when the poultice does not appear necessary, cold fomentations may be continued, using either some infusion of camomile, or one part of tincture of arnica to twelve of water, or one part of Goulard's extract to a similar quan

tity of water. The severe symptoms speedily subside, unless the bones are fractured or the joint otherwise seriously injured. Usually, the wound heals rapidly, the joint-oil ceases to flow; and in order to insure a contraction of the wound, mild astringent or caustic applications should be used, such as tincture of myrrh, sulphate of zinc lotion, or sulphate of copper in crystal rubbed over it. When the wound is thoroughly healed, the hair may not grow rapidly, even in parts where it should form; in this case its production may be accelerated by the use of a very mild cantharidine ointment, which should act as a mild irritant, but not as a blister. In some cases of severe broken knee, it is advisable to fix the limb so that the animal may not move the joint much. In veterinary jurisprudence, a broken knee is regarded as a *blemish*, not as an unsoundness.

BROKEN WIND: a disease or unsoundness of the respiratory organs of the horse, which, from the French *pousse*, was termed, by some of the old English writers on farriery, *pursiness*. The Germans term it *Dämpfigkeit*, or asthma, though in many of their works it receives also the name of *Herzschlägigkeit*, from a belief that it consists in palpitation of the heart. The nature of the malady is not well understood, though it appears in the form of difficulty in the act of expiration, the horse making an extraordinary or spasmodic effort to expel from the lungs the air which has readily entered them in inspiration.

Symptoms.—A broken-winded horse is usually an animal that does not thrive, is lean, and has a dependent belly, the muscles of which are unusually active as expiratory muscles. The characteristic symptoms are best observed when the horse is exercised, the breathing becoming labored, the nostrils dilated, the eyes bloodshot, and even blue, showing imperfect purification of blood in the lungs. On watching the chest and flank, the ribs are observed very actively moved, and after collapsing, when the air is expelled from the lungs, are further depressed by a spasmodic jerk brought about by the abdominal muscles. A broken-winded horse has a bad cough, of the kind referred to by veterinarians as characteristic of unsoundness, and termed *a hollow cough*. When the animal is oppressed by fast work, or dragging a load up a hill, the pulse is excessively rapid, and the heart beats energetically. Hence, it is regarded by some as a disease of the heart. Others have believed the diaphragm affected, but in reality it is the lungs, or the apparatus for expelling the air from these organs, that is at fault. The diaphragm being a muscle of inspiration, it is probably in no way implicated. No doubt, when the heart is diseased, the function of breathing is sometimes much affected, but these are not the symptoms of true B. W., any more than when the lungs are in part rendered impervious to air, and the act of inspiration is rendered short. This condition constitutes *thick wind*, and is often one of the remote results of inflammatory disease of the lungs.

Causes.—Low-bred horses are liable to B. W., especially if improperly fed on innutritious and bulky food, and at the

same time kept at hard and fast work. Whatever may be the way in which the condition of the alimentary canal operates in producing B. W., of this we are certain, that the function of digestion is much impaired. Indeed, the term B. W. is believed to have had reference originally to the constant escape of flatus. B. W. is far more rare recently than of old, and it is at present most common in those countries where horses are worst managed, and fed almost exclusively on coarse, indigestible, or innutritious kinds of hay and beans.

Treatment.—The treatment of B. W. is unsatisfactory; and only a palliation of the symptoms may be wrought by keeping the alimentary canal in proper order, administering occasional purgatives, and feeding on a proper quantity of the best oats, which should always be bruised; also allowing the horse the best hay in spare quantities—10–12 lbs. daily. Some veterinarians have vaunted their powers in curing this disease, and recommended large doses of camphor, digitalis, and opium; but these potent narcotics operate for only a very short time, and as their effects pass off, the symptoms return, often with increased severity. B. W. is incurable; and horses suffering with it frequently drop down exhausted when at hard work, and die from congestion of the lungs, hemorrhage, or simple suffocation.

B. W. is so bad a form of unsoundness, that horse-dealers sometimes attempt, and even successfully, to hide the defect for the time they may be engaged in the sale of a horse, and this they do by causing the animal to swallow *shot* or *grease*. A certain portion of lead weighing in the stomach has a wonderful effect in diminishing the symptoms, which become again obvious a few hours after the ruse has been practiced on some unwary purchaser.

BRO'KER [Middle English *brocour*, which occurs in *Piers Plowman* and the *Liber Albus*, formed from the Anglo-Saxon verb *brúcan*, to manage, to contrive; cognate with the German *brauchen*. From the same root is our word *brook*, to put up with anything]: agent employed to make bargains and contracts between other persons, in matters of finance, trade, commerce, or navigation, for a compensation commonly called brokerage. Where he is employed to buy or sell goods, he is not intrusted with the custody or possession of them, and is not authorized to buy or sell them in his own name. In this respect, he differs from a factor (q. v.), and he differs from an auctioneer in two particulars: a B. may buy as well as sell, but an auctioneer can only sell; a B. cannot sell personally at public auction, for that is the appropriate function of an auctioneer, but he may sell at private sales, which an auctioneer (as such) does not. A. B. is strictly a middle-man, or intermediate negotiator between the parties, and for some purposes, he is treated as the agent of both parties, but primarily he is deemed the agent of the party by whom he is originally employed. There are several sorts of brokers: see STOCK-BROKERS: SHIP-BROKERS: BILL-BROKERS: there are also insurance

brokers, share brokers, real estate brokers, etc. Persons who appraise goods, sell or distrain furniture for rent, are also called brokers, though differing entirely in their occupations from the preceding commercial agents. The business of a Pawnbroker (q.v.) also is different.

In the United States the term broker used alone, signifies a dealer on commission in money, stocks, or bonds: the business sometimes is carried on in some connection with that of banking in private hands.

BROMA, n. [Gr. *brōma*, food]: powdered cacao-seed, the beverage prepared from this.

BROMAL, n., colorless liquid ($C\ Br_3COH$) obtained by the action of Bromine on alcohol; it has a pungent taste and penetrating odor.

BROMATE, n. *brō'māt:* a salt of bromic acid.

BROMATOLOGY, n. *brŏm-a-tŏl'o-jĭ* [Gr. *brōma*, gen, *brōmatos*, food; *logos*, a discourse]: a discourse, dissertation, or treatise, on ailments.

BROMBERG, *brŏm'bĕrg:* town of Prussia, province of Posen, 69 m. n.e. from the city of Posen; on the Brahe, about 6 m. from its junction with the Vistula. B. has manufactures of woolens, linen, chicory, tobacco, and Prussian blue; a large sugar-refinery, distilleries, breweries, potteries, and corn-mills. The Bromberg canal, by uniting the rivers Netz and Brahe, connects the Oder and Elbe with the Vistula. Pop. 46,417.

BROME, *brōm*, Alexander, English poet and dramatist: b. 1620; d. 1666. He seems to have been a lawyer by profession, and at one time attorney to the court. He is best known as the author of many royalist songs and epigrams. He published *The Cunning Lovers*, a comedy (1654); *Fancy's Festivals* (1657); *Songs and Poems* (1661); *Translation of Horace* (1666).

BROME, Richard, English dramatist: d. about 1652. He was at first the servant and afterward the friend of Ben Jonson, who encouraged him in his literary work, and on whose style his plays are modeled. The best and most popular of his dramas, some of them comedies dealing with the everyday life of his time and others of a more romantic character are: *The Court Beggar* (acted 1632); *The Love-sick Court* (published 1659); *The Queen and Concubine* (published 1659); *The Northern Lass* (printed 1632); *The Sparagus Garden* (acted 1635); *The Antipodes* (acted 1638), and *A Jovial Crew* (acted 1641).

BROME-GRASS, *brōm-* [Gr. *bromos*, wild oats]: genus of grasses, very nearly allied to Fescue (q.v.), with flowers in lax panicles, glumes many-flowered, the outer palea bifid as the extremity, and awned beneath, and the very short stigma growing from the face of the germen, beneath its apex. The species are numerous, and some of them are very common British

grasses—none more so than the Soft B. (*B. mollis*), an annual or biennial, which has very soft downy leaves, grows well on poor soils, and is readily eaten by cattle, but is not much esteemed by farmers, for either the quantity or quality of fodder which it yields. Its seeds have also the reputation of possessing deleterious or poisonous properties: and those of two other species of this genus, *B. purgans* and *B. catharticus*, the former a native of N. America, and the latter of Chili, are said to be emetic and purgative. The whole subject of the existence of poisonous properties in the seeds of any of these grasses requires further investigation. Soft B., although now disliked by farmers, was formerly sown as fodder-grass, and its large seeds were even regarded as making hay more nutritious; so that there are some who view its present proscription as requiring a reconsideration. Very similar to it are Smooth B. (*B. racemosus*), Field B. or Meadow B. (*B. commutatus* or *B. pratensis*, and *B. arvensis*), all of which seem to resemble it in their properties.—The Tall B. (*B. giganteus*, also known as *Festuca gigantea* and *Bucetum giganteum*, native of Britain, which reaches the height of four or even five feet, affords a great bulk of foliage, but is not much relished by cattle. Naturally growing in shady places, it thrives even in dense woods, and is sometimes sown to form covert for game.—Rye B. (*B. secalinus*) is generally regarded as a troublesome weed, especially in fields of rye. It is very abundant in some parts of Europe. When young it has great resemblance to rye. Its seeds, which are large, retain their power of germination for years, and do not lose it by passing through the intestines of animals. Deleterious effects have been erroneously ascribed to bread made from rye, with which these seeds have been ground; but poultry are very fond of them, as of those of other species of this genus.

BROMELIA'CEÆ: a natural order of monocotyledonous plants, allied to *Amaryllideæ* and *Irideæ*, stemless, or with short stems, and rigid, channelled, often spiny and scaly leaves. The flowers are in racemes or panicles; the calyx 3-parted or tubular, persistent, more or less cohering with the ovary; the petals three, withering or deciduous, equal or unequal, imbricated in bud. The stamens are six, inserted into the tube of the calyx and corolla, the anthers opening inward. The ovary is 3-celled, the style single, the fruit capsular or succulent, many-seeded; the seeds with a minute embryo lying in the base of mealy albumen.—The order contains about 170 known species, all natives of the tropics and warmer parts of America, although some of them are now naturalized in Asia and Africa. The best known plant of the order, and the only one much valued for its fruit, is the Pine-apple (q.v.). Bromeliaceæ, with their strong spiny leaves, cover the ground

in many places, so as to form impenetrable thickets, Many of them are epiphytic, or grow upon trees, without being parasites, particularly the species of *Tillandsia*, one of which is the New Orleans Moss, Long Beard, or Old Man's Beard of the West Indies and of the s. parts of the United States, hanging from the trees like the lichens of colder climates. The leaves of some are so formed and placed as to retain near their base a quantity of water, often affording delicious refreshment to the traveller in a hot climate. The water is, perhaps, of use to the plant in droughts. Not a few of the Bromeliaceæ are capable of vegetating long without contact with earth, and of sustaining long drought without inconvenience, for which reason, and because of their beautiful and fragrant flowers, some of them are frequently suspended from balconies in S. America as air-plants. But the plants of this order are valuable more generally for their fibres than upon any other account. *Tillandsia usneoides*, the New Orleans Moss already mentioned, yields a fibre, easily obtained, and in great abundance, which is used instead of hair for stuffing mattresses. The fibres of the leaves of the pine-apple, and of some other species of this order, have been made into fabrics resembling the finest white muslin, while they are found also of sufficient strength for cordage. It is supposed that the produce of different species of *Bromelia* is often included with that of the American Aloe or *Agave* (q.v.), under the name of *Pita* fibre or Pita flax, the appearance and properties of the fibres being very similar, as well as those also of the fibres of the species of *Yucca*. The fibre of the pine-apple is, in some countries, frequently twisted into fishing-lines, and made into nets and into ropes intended for immersion in water, being little liable to injury from this cause. Abundant as the plant is in its native regions, and now so perfectly naturalized as to form thickets in many parts of the old world, there seems no limit to the quantity of this fibre which might be procured.—The Pine-apple cloth of the Philippines is called *Pina muslin* and *Batiste d'ananas;* also sometimes erroneously called *Grass*-cloth. 'With a magnifier, the fibres may be seen to be very numerous and fine, but not twisted at all, as in grass-cloth or the finest muslins and cambrics.' The Philippine pine-apple fibre is obtained from a species called by the Spaniards *pigna* or *pina* (a cone), and which has by botanists been named *Bromelia Pigna*, although some regard it as a mere variety of the pine-apple, with small and rather dry fruit. It grows in great abundance in the Philippine Islands, and is cultivated by the Chinese near Singapore, and the fibre exported to China. This fibre is prepared also in Malacca, Java, Celebes, etc. When bleached, the pine-apple fibre can be spun like flax.

The Wild Ananas (*Bromelia Pinguin*) of the West Indies, the *Bromelia Karatas*, common in S. America,

the *B. Sagenaria,* common in some parts of Brazil, and the *Billbergia variegata,* which grows in wild luxuriance in Mexico, where it is called *Caroa,* often covering miles of country—all yield fibres which are used for cloth, cordage, nets, etc. The fibre of *Bromelia Sagenaria* is known as *Curratow* fibre: very strong ropes are made of it.

The genus *Bromelia* has a 3-parted calyx shorter than the corolla, and the fruit is succulent. The species are numerous, the leaves of all of them are more or less characterized by spiny serratures. The fruit of *B. Pinguin,* already mentioned, affords a cooling juice, used in the West Indies mixed with water, as a drink for patients in fever and dysentery. It is said to be diuretic. A vinous liquor is sometimes made from it.

BROMIC ACID, *brō′mĭk:* only known compound of bromine and oxygen: prepared by acting upon bromine (Br) by caustic potash (KO), when much bromide of potassium (KBr) is formed, accompanied by bromate of potash ($KOBrO_5$), a compound of potash and Bromic Acid. It likewise combines with silver, lead, and mercury, yielding salts styled Bromates.

BROMINE, n. *brō′mĭn* [new L. *bromĭŭm*—from Gr. *brōmos,* a bad smell]*:* a metalloid, an elementary body related to chlorine and iodine in its chemical properties. BROMAL, n. *brō′măl,* a dark, brownish-red, heavy liquid, having a strong peculiar smell; an oily colorless fluid, obtained by the action of bromine on alcohol. BRO′MIC ACID, *-mĭk,* a compound of bromine and oxygen. BROMATE, n. *-māt,* a compound of bromic acid with a base. BRO′MIDE, n. *mĭd,* a compound of bromine with a metal; alkaline bromines crystallize in cubes or right-angled prisms; they are easily soluble in water. Bromide of sodium is a favorite quieting medicine in cases of nervousness, whose safety in the excessive use now common begins to be questioned by physicians. BRO′MITE, n. *-mīt,* or BROMIC SILVER, an ore of silver occurring in olive-green grains. BRO′MOFORM, the ter-bromide of formyl, analogous to iodoform and chloroform; sym. $CHBr_3$; a heavy volatile liquid. BROMURET, n. *brŏm-ū-rĕt,* a basic compound of bromine and another element.

BROMINE, *brō′mĭn* (symb. Br; equiv. 80; spec. grav. 2·96): one of the chemical elements. It was discovered in 1826 by Balard, in the salts obtained by the evaporation of sea water. B. is liberated from the sodium and magnesium salts by the action of free chlorine, and is separated by ether, which dissolves the B. This red-colored solution is removed, saturated with potash, evaporated, and heated to redness, and the bromide of potassium is heated with manganese dioxide and sulphuric acid. The bromine is liberated in the form of a deep red vapor, which condenses into a dark reddish-black liquid. Specific gravity, 2.97. It boils

at 63°, and its vapor density is 5.54 times that of air. It has an irritating smell, and when inhaled is poisonous. It dissolves in 30 parts of water, and the solution has weak bleaching properties. B. and hydrogen do not unite in the sunlight, but do when they are passed through a red-hot porcelain tube, forming hydrobromic acid (HBr), which is also obtained by the action of phosphorus and water on bromine. It is a colorless, fuming gas, which liquefies at 73°, very soluble in water. The concentrated solution contains 47.8 per cent. of HBr; it boils at 126°, and has powerful acid properties; it neutralizes bases, forming bromides and water. Hypobromous acid, HBrO, is only known in solutions; it has bleaching properties. Bromine can displace chlorine from its compounds with oxygen, while chlorine can liberate bromine from its compounds with hydrogen. Free B. turns starch yellow.

B. has been applied externally as a caustic but rarely. Its chief officinal preparations are bromide of ammonium, useful in whooping-cough, infantile convulsions, and nervous diseases generally; and bromide of potassium, now very extensively used, especially in epilepsy, hysteria, delirium tremens, diseases of the throat and larynx, bronchocele, enlarged spleen, hypertrophy of liver, fibroid tumors, etc. Also, as an antaphrodisiac, for sleeplessness, glandular swellings, and skin diseases. The alterative properties of bromide of potassium are similar to, but less marked than, those of the iodides. Its preparation is the same as iodide of potassium, substituting an equivalent quantity of bromine for iodine—$6KHO + Br_6 = 5KBr + KBrO_3 + 3H_2O$. It has a pungent saline taste, no odor, and occurs in colorless cubic crystals, closely resembling the iodide. As a hypnotic its usefulness is much increased by combining it with morphia or chloral hydrate.

BROMLEY: town in England, 10 m. s.e. of London; it contains the palace of the bishop, to which bishopric the manor has belonged since abt. 600. St. Blaize's well, in the palace garden, was famous prior to the Reformation. At B. are several institutions of learning or charity, and a college for the residence and support of clergymen's widows, founded by Bp. Warner 1666.

BROMLEY, William: 1769–1842; b. Carisbrooke, in the Isle of Wight: English engraver of moderate repute. He engraved portraits of Wellington and Napoleon, which brought him into public notice, but was known mostly by his illustrations to Macklin's edition of the Bible.

His son, John B. (b. Chelsea, d. 1839), was a noted and successful engraver in mezzotint. William B., another of the family, was an engraver, and landscape and *genre* artist. Still another of the family, Valentine B. (1848–77, son of the last William B.), received a gold medal at the exhibition of paintings, 1877, and

was on the staff of the *London Illustrated News*. *The Fairy Ring* is the best specimen of his work in oil.

BRO'MOFORM, a clear, heavy, volatile liquid of etheral odor and sweetish taste, soluble in alcohol or ether though not in water. It is analogous to iodoform and chloroform, and is made like the latter from alcohol or acetone. It is somewhat anesthetic and has been used like chloroform, but its special use is in 'whooping cough,' in which a few drops are given in solution or mixture several times a day.

BROMSEBRO, *brĕm'sĕ-brô:* village of Sweden, in the län, and 27 m. s. of the town, of Calmar: the place where treaties were entered into between Sweden and Denmark, 1541, 1641, and 1645.

BRÖMSGROVE, *brŏmz'grōv:* market-town of Worcestershire, Eng., near the small river Salwarp, 12 m. s.s.w. from Birmingham; 1½ m. e. from a station on the Birmingham and Bristol railway. The Birmingham and Worcester canal also passes near it. It is in a highly cultivated and richly wooded valley. The principal street is about a mile in length. There is a very flourishing grammar-school, founded by Edward VI. 1553. The linen manufacture was formerly carried on at B.; button-making and nail-making are at present the principal industries. Pop. 8,000.

BRONCHI, n. plu. *brŏng'kī*, or BRONCHIA, n. plu. *brŏng'kĭ-ă* [Gr. *brongchos*, the windpipe; *brong'chĭă*, the bronchia]: the tubes that branch off from the windpipe to the lungs; the subdivisions of the trachea or windpipe. Opposite the third dorsal vertebra, the latter divides into two branches or B., of similar structure to itself—namely, round and cartilaginous in front; and flat, with muscular and fibrous tissue behind, lined with mucous membrane. Of these B., one goes to each lung, the right being little more than an inch; the left, about two inches in length. On entering the substance of a lung, the B. divide into smaller branches, which again subdivide, until they are no larger in diameter than one-fiftieth to one-thirtieth of an inch, which give origin to, or terminate in, small polyhedral cells, which seem to cluster round their extremities, and open into them. These are the air-cells; they consist of elastic tissue, with a lining of mucous membrane, and beneath the latter, a layer of minute blood-vessels of the lung: see RESPIRATION, ORGANS AND PROCESS OF. BRON'CHIAL, a. *-kĭ-ăl*, or BRON'CHIC, a. *-k'k*, pertaining to the bronchi. BRONCHIOLE, n. *brŏng'kĭ-ōl*, a small bronchial tube.

BRONCHI'TIS, n. *-kī'tĭs* [*itis*, denoting inflammation]: inflammation of the air-tubes or bronchi that lead to the lungs. BRONCHITIC, a. *brŏngkĭt'ic*, of or pertaining to bronchitis. BRON'CHOCELE, n. *-kō-sēl* [Gr. *kēlē*, a tumor]: a tumor on the fore part of the neck, due to an enlargement of the thyroid gland—also called *goître*. BRONCHOT'OMY, *n. -kŏt'ō-mĭ* [Gr. *tomē*, a cutting]: an

incision into the windpipe between the rings—when the trachea is cut the operation is called *tracheotomy*—and when the larynx, *laryngotomy*. BRON'CHUS, n. *-kŭs*. BRON'CHI, n. plu. *-kī*, one of the subdivisions of the trachea or windpipe. BRONCHOPH'ONY, n. *-kŏf'ŏ-nĭ* [Gr. *phonē*, voice]: the muffled and indistinct speech of any one laboring under a bronchial affection.

BRONCHITIS, *brŏng-kī'tis:* inflammation of the lining membrane of the bronchial tubes; a common disease of varying degrees of severity from a slight 'cold in the chest' of brief duration to a rapidly fatal pulmonary disorder. B. may be acute or chronic, according as it is of brief or long duration; tubular or capillary, according as it involves the larger or smaller bronchial tubes; when the inflammation extends from the terminal bronchial tubules into the air-vessels in the lungs the disease is called bronchopneumonia. See CATARRH and LUNGS.

BRONCO, n. *bronkō* [Sp.]: a half wild Indian pony, a mustang.

BRONDSTED, or BRÖNSTED, *brĕn'stĕd*, PETER OLUF: 1780, Nov. 17—1842; b. near Horsens, Jütland: archeologist. He studied at the Univ. of Copenhagen; and, 1806, went to Paris, where he remained two years. He afterward went with Baron Stackelberg's expedition to Italy and Greece, where he made excavations which furnished valuable materials for the study of classical antiquity. Returning, he was made prof. of Greek in the Univ. of Copenhagen. Afterward he was Danish envoy at Rome. In 1832 he became prof. of archeology and philology at Copenhagen, and 1842 rector of the univ. Brondsted's principal work is *Travels and Researches in Greece* (2 vols., Paris, 1826). In addition to several smaller archeological papers, among which was one in English, entitled *An account of some Greek Vases found near Vulci* (Lond. 1832), and another on the bronzes of Siris, which appeared at Copenhagen, 1837, B. wrote some valuable contributions to Danish history from mediæval Norman manuscripts (2 vols., Copenh. 1817–18), and *Memoirs of Greece during the Years* 1827 *and* 1828 (Paris, 1835).

BRONGNIART, *brōng-yâr'*, ADOLPHE THEODORE: 1801–76; son of Alexander B.; was author of several botanical works held in high esteem: in 1833 became prof. of botany at the Jardin des Plantes, Paris, and 1834 member of the Acad. of Sciences. In 1852 he was elected a foreign member of the Royal Soc. of London.

BRONGNIART, *brōng-yâr'*, ALEXANDER: 1770–1847, Oct. 14; b. Paris: chemist and naturalist. He is said to have delivered a lecture on chemistry before the age of 15. In 1790, he visited England for a scientific examination of the Derbyshire mines and pottery works, and, on his return, published a *Mémoire sur l'Art de*

l'Emailleur. Appointed in 1800 director of the porcelain manufactory at Sèvres, he held that office for the remainder of his life, and revived the almost lost art of painting on glass. In his *Essai d'une Classification des Reptiles,* 1805, he established the four divisions of reptiles, and first gave them the names of *Saurians, Batrachians, Chelonians,* and *Ophidians.* His *Traité Elémentaire de Minéralogie,* published 1807, at the instance of the Imperial Univ., became a text-book for lecturers. In 1814 appeared his *Mémoire sur les Corps Organisés Fossiles nommés Trilobites,* a name which, as well as a basis of classification for those singular *Crustacea,* naturalists owe to Brongniart. In 1815 he was elected a member of the Acad. of Sciences of the French Institute; he was also a member of the Royal and Geological Societies of London, and of other learned bodies. In 1845, appeared his *Traité des Arts Ceramiques.*

BRONI, *bro'nē:* town of n. Italy, province of Pavia, about 11 m. s.e. of the town of Pavia, in a beautiful situation at the foot of the Apennines. It has a singular old church, some portions of which date from the 10th c. In its vicinity is the castle of B., celebrated in history as the place where Prince Eugene obtained a victory over the French 1703. Pop. about 7,000.

BRONN, Heinrich Georg: 1800, Mar. 3—1862; b. Ziegelhausen: German naturalist. He was educated at Heidelberg Univ. In 1828, he commenced at Heidelberg a course of lectures on the physical and industrial sciences, and in 1833 was nominated ordinary professor of the same. After Leuckhardt's departure from Freiberg, Bronn was appointed to the zoological lectureship. He wrote several important scientific treatises. His first was *A System of Antediluvian Conchylia* (Heidelberg, 1824), which was followed by *A System of Antediluvian Zoophytes.* In 1824, he visited s. Europe; and in 1827, made a second journey to Italy. On his return, he published the results of his journey (2 vols., Heidelberg 1825–30). In 1834 appeared his most important geological work—*Lethæa Geognostica;* in 1841–49 his *History of Nature;* and in 1850, his *Universal Zoology,* the first attempt to develop zoology in its entirety with reference to extinct organisms.

BRONNER, Johann Philipp: 1792–1865: German writer and authority on wines, who gave years to the study of their nature and production, and published more than a dozen treatises concerning the culture of the vine and the manufacture of wines. In 1831 he established a school for teaching the art of manipulating the grape. More recently he was commissioned by Baden to travel over the continent and to visit and inspect all the grape-growing countries. This he did, and made voluminous and careful reports on the results.

BRONTE, *brŏn'tā:* town in the province of Catania, Italy, at the western base of Mount Etna, about 22 m. n.n.w. of the city of Catania. B. has manufactures of woolen and paper, and the district produces oil, almonds, wine, etc. But the town is noted chiefly for its connection with Admiral Lord Nelson, who was created Duke of B. by the Neapolitan government 1779, with an annual income of 6,000 *oncie* (about $18,750). Pop. (1881) 16,427; (1903) 19,000.

BRONTE, CHARLOTTE: 1816, Apr. 21—1855, Mar. 31; b. Thornton, in the West Riding of Yorkshire: novelist. Her father, a clergyman of Irish descent, removed, with six young children and an invalid wife, from Thornton to Haworth in the same county, in 1821. Soon after their arrival, Mrs. Bronte died, so that Charlotte, in after-life, could but dimly remember her mother. Her father, eccentric and solitary in his habits, and with extravagant theories for making his children hardy and stoical, was ill fitted to replace a mother's love. When Charlotte was eight years old, she was sent with three of her sisters to Cowan's Bridge School, which, whether deservedly or not, received unfortunate notoriety 25 years later in the pages of *Jane Eyre.* Her eldest two sisters falling dangerously ill, and dying a few days after their removal thence, and the low situation evidently disagreeing with Charlotte's health, she was sent home when little more than nine, and remained there, 'the motherly friend and guardian of her younger sisters,' till 1831, she was sent to Miss Wooler's school at Roe Head, where her genius was appreciated by her kind instructress, and life-long friendships formed with some fellow-pupils. A few years later, she returned to Miss Wooler's school as teacher, and also had some sorrowful experiences as governess in one or two families. It was with a view of better qualifying themselves for the task of teaching that Charlotte and her sister Emily went to Brussels 1842, and took up their abode in a *pensionnat.* When Charlotte returned home 1844, a new shadow darkened the gloomy Yorkshire parsonage. Her father's sight was declining fast, and her only brother was a source of continual anxiety. It now seemed plain that school-keeping could never be a resource, and the sisters turned their thoughts to literature. Their volume of poems was published 1846; their names being veiled under those of Currer, Ellis, and Acton Bell, but it failed to get public attention. Charlotte's next venture was a prose tale, *The Professor,* and while it was passing slowly and heavily from publisher to publisher, *Jane Eyre* was making progress. In 1847, Aug., it was submitted to Messrs. Smith & Elder, and published by them two months later. It took the public by storm. It was felt as the work of a fresh hand, making new harmonies. Henceforward, Charlotte had a 'twofold

life, as author and woman.' Over the latter, the clouds closed thicker and thicker. Mr. Bronte had indeed recovered his sight: but the sister that Charlotte so intensely loved, and whose genius she ever delighted to exalt above her own, Emily—the Ellis Bell of *Wuthering Heights*—died in 1848. Her only brother also died in the same year; and Anne, the youngest of the family, following 1849, Charlotte was left alone with her aged father in that dreary deserted home among the graves. Nevertheless her energy never flagged. *Shirley*, begun soon after the appearance of *Jane Eyre*, was published in the autumn of 1849; and *Villette*, written under the frequent pressure of bad health and low spirits, came out in 1852. In the spring of 1854, Charlotte was married to her father's curate, the Rev. A. Nicholls, who had long known and loved her. It is a relief to find that a little bright sunshine was permitted to the close of a hitherto clouded life. It was brief; for serious illness set in, and in the following spring she died. A fragment of an unfinished novel appeared in the *Cornhill Magazine*, 1860, Apr. See Mrs. Gaskell's *Life of C. B.*, (1857).

BRONTERN, n. *brŏn'tĕrn* [Gr. *bronte*, thunder]: a brass vessel in the basement below a stage, to produce an imitation of thunder.

BRONTOTHERIDÆ, n. plu. *brŏn'tō-thĕr ĭ-dē* [Gr. *brontēs*, a giant; *therĭon*, a beast]: an order of extinct tertiary mammals.

BRONZE, n. *brŏnz* [F. *bronze*—from It. *bronzo*, bronze —from *bruno*, brown: Sp. *bronce*, bronze, pan-metal: Icel. *brasa*, to braze or solder]: a metallic substance principally made of copper and tin, with sometimes a small quantity of lead or zinc; a color to imitate bronze; any figure or medal made of bronze is called *a bronze*, especially ancient ones: V. to imitate bronze by a coloring matter. BRON'ZING, imp.: N. the art or act of giving to articles the appearance of bronze. BRONZED, pp. a. *brŏnzd* [prov. It. *bronze*, glowing embers, bronze]: colored like bronze; tanned; sunburnt. BRON'ZY, a. *-zĭ*, like bronze. BRON'ZITE, n. *-zīt*, a variety of diallage or schiller-spar, so called from its metallic lustre and pinchbeck color. BRONZE-POWDER, a metallic powder used to give to tin and iron goods, etc., a bronze-like appearance.

BRONZE: reddish-yellow, fine-grained alloy of copper and tin, in variable proportions. It was early known, and what is usually spoken of as the *brass* of the ancient nations, was in reality bronze. The brass or bronze referred to in the Bible was probably composed of copper and tin, though some translators consider it likely to have been copper alone. The examination of the most ancient coins and metallic ornaments and implements leaves no doubt as to the acquaintance of the ancients with bronze; so much so, that in the anti-

quarian history of European nations, there is a distinct period styled the *Bronze Period* (see BRONZE, AGE OF). At the present time, bronze is largely used for house and church bells, Chinese gongs, ordnance or cannon metal, and speculum or telescope metal. In the preparation of the various kinds of bronze, great care must be taken to keep the tin from being burned away or wasted. To obviate this, it is customary to use much old bronze, as worn-out cannon, etc., and when that is fused in the furnace, to add the new copper and tin. The best Cornish and Banca tin are employed for the better kinds of castings, especially where strength of alloy is required. For inferior work, old scrap tin, which often contains lead, is used; and where strength of material is not an object, a little zinc and lead are added. In either case, during the fusion of the mixed metals in the furnace, at a high temperature, as little air as possible must be admitted to the furnace, otherwise the metals are oxidized, and the alloy is deteriorated. Bronze, when well made, is, excepting gold, platinum, and some of the rare metals, the most durable metallic material known; and this, coupled with its extreme hardness, rendering it difficult for time and ordinary wear and tear to efface inscriptions or medallions stamped on it, led the mint in France, some years ago, to issue bronze coinage in place of copper; since 1860 bronze coinage has taken the place of copper in Great Britain.

The principal varieties of bronze have the following average composition:

		Copper.	Tin.
	Brass ordnance or bronze cannon	9	1
	Bronze for toothed wheels	10	1
	" for mathematical instruments	12	1
	" for bearings of machinery	8	1
	Chinese gongs and cymbals	5	1
	Musical bells	6	1
	House bells	4	1
	Large bells	3	1
	Telescope or speculum metal	2	1
Ancient.	Mirrors	2	1
Ancient.	Hard bronze	7	1
Ancient.	Medium bronze	8	1
Ancient.	Soft bronze	9	1
Ancient.	Flexible bronze nails	20	1

Recently, bronze has been deposited on small statues and other articles, in greater or less thickness, by the electrotype process (see GALVANISM).

The novel word *steel-bronze* first began to be common about 1875, when Uchatius devised a new method of hardening the old bronze of the Austrian guns. This steel-bronze, with which Austria is mainly armed, has accordingly no steel in it; but is almost as hard as cast steel. *Silico-bronze* and *phosphorus-bronze* are copper alloyed with silicon and phosphorus respectively, and are used for conducting electricity. *Manganese-bronze* is valuable for making screw-propellors.

BRONZE, Age of: in Archeol., the second of the three successive periods into which, as some modern writers hold, the primitive or prehistoric antiquities of a country may be divided. They take for granted that among a rude or savage people, stone would come into use before any kind of metal; and that of metals, copper being oftener found ready for the hammer, would come into use before iron. These assumptions—which accord with what has been observed among uncivilized races—have obtained from a very early date. Lucretius, writing in the c. before the Christian era, recorded them with his usual vigorous precision (*De Rer. Nat.*, v. 1282). More than one antiquary of the last c. appears so have suggested the distribution of archeological objects into eras of stone, of copper or bronze, and of iron. But the proposed classification received scarcely any attention until about 50 years ago, when it was adopted and developed by C. J. Thomsen, supt. of the Ethnographical and Archæological Museum of Copenhagen, in his *Ledetraad tit Nordisk Oldkyndighed* (Kjöbenhavn, 1836), and by Mr. Nilsson, prof. of zoology in the Univ. of Lund, Sweden, in his *Skandinaviska Nordens Urinvonare* (Lund, 1838–43). According to the theory of these writers — held by almost all archeologists in Denmark, Sweden, and Norway, by many in n. Germany and in Switzerland, and by a few in other parts of Europe—the first three stages in the progress of a nation from barbarism to civilization are as clearly identified and defined by their relics of stone, of bronze, and of iron, as the comparative antiquity of geological strata, or of periods of the world's creation, is determined by the fossils which they are found to contain.

The name of the 'age of stone' is given to the period when weapons and implements were made of stone, amber, wood, bone, horn, or some such easily wrought material, and during which very little or nothing was known of metals. During this era, the people, few in number, and savage in their habits, clothed themselves chiefly with skins of animals. They buried their dead in large sepulchral chambers, covered by what have been called *cromlechs*, or girdled round by the unhewn stone pillars called 'Druidical circles.' The bodies have most frequently been found unburned, often with rude urns beside them.

During the 'age of B.' weapons and implements were made of copper or of bronze, and iron and silver were little or not at all known. The dead were burned, and their ashes kept in urns, or deposited in stone-chests, covered by conical mounds of earth or heaps of loose stones. In the urns, articles of gold and amber are found, but never of silver. Most articles of metal appear to have been cast; where marks of the hammer appear, it is contended that the forging or beating must have been by a stone hammer upon a stone anvil.

The 'age of iron' is the name applied to the third and last of the three supposed periods. During this era, it is conceived that iron displaced bronze in the manufacture of weapons and implements, and that silver and glass came

ened use. The dead were still occasionally burned; but they were frequently buried without burning, often seated on chairs, and, at times, with a horse in full war-harness laid beside the body of his master.

The Scandinavian and German antiquaries admit that their three periods run, more or less, one into another; that stone weapons continued to be used throughout the age of B.; that bronze and gold were not unknown in the age of stone; and that weapons of stone and bronze continued to be used in the age of iron. This admission obviously detracts much from the practical value of the classification for chronological or other scientific purposes. But the late J. M. Kemble, and other British antiquaries, have taken objections to the classification altogether, as irreconcilable with generally admitted facts, when carried out to its strict and necessary consequences. They point to the everyday discovery of objects of stone, bronze, and iron, in the same ancient urns, graves, and dwellings. They instance the case of the Huns, who had swords of iron, while they pointed their arrows with bones; the case of the Anglo-Saxons, who fought with stone mauls at Hastings; and the case of the Germans, who used stone hammers in the Thirty Years' War. They show stone weapons, in some of which the traces of metal are still fresh, while others attest for themselves that they could not have been cut but by a thin sharp metal point.* They prove from Greek and Roman writers that the nations of the n. and w. of Europe used iron weapons during what must have been their B. age. And they repudiate the proposed appropriation of different modes of burial to the different ages—a point on which the supporters of the theory appear hopelessly divided among themselves—on the ground, that graves assigned to the bronze period have been found to contain more iron than bronze, and that other supposed characteristics of sepulchres of the bronze age are quite as common in sepulchres of the iron age. But although the threefold classification of the Scandinavian and German archeologists cannot be relied upon for historical uses, it may be accepted as a very convenient mode of arranging archeological objects. It has been adopted, with some modifications, in the gallery of British antiquities in the British Museum at London, in the National Museum of the Antiquaries of Scotland at Edinburgh, in the Museum of the Royal Irish Acad. at Dublin, and in other collections, where the articles are classed, for the most part, according to the materials of which they are made.

*M. Frederic Troyon, of Lausanne, one of the Swiss antiquaries who accept the three periods of their Scandinavian brethren, instances certain stone axes (now in the collection of Baron Renberg, at Prague), which were found, with their cores, at the site of a primitive manufactory of these weapons in Bohemia. 'These cores,' he says, 'when replaced in the holes from which they had been taken (easily verified by the corresponding veins of the stone), left so little play-room, that it was evident they could only have been detached by a metal point, and not by a hollow cylinder, which could not have given to the hole its conical form, now quite apparent. Instead of the soft iron now employed in such operations, the ancients used copper or bronze; and, of course, water and siliceous sand were likewise employed in the process.'

MODERN BRONZE WORK.

BRONZE-WING, or BRONZE-WINGED PIGEON, or BRONZE PIGEON: names given in the Australian colonies to certain species of pigeon (see PIGEON and COLUMBIDÆ) chiefly of the genus *Peristera* of Swainson, on account of the lustrous bronze color with which their wings are variously marked. They are otherwise also birds of beautiful plumage.—The COMMON B. or Bronze-winged Ground Dove (*Columba* or *Peristera chalcoptera*) is distributed over all the Australian colonies. It is often seen in flocks, feeds on the ground, and builds its nest chiefly on low branches of trees growing on meadow-lands or near water. It is a plump bird, often weighing fully a pound, and is acceptable at table.—The BRUSH B. or Little Bronze Pigeon (*C.* or *P. elegans*) is not so plentiful nor so widely distributed, chiefly inhabiting Tasmania and s. Australia. It inhabits low swampy grounds, never perches on trees, resembles a partridge in its habits, and makes a loud burring noise like a partridge when it takes wing on being alarmed.—The HARLEQUIN B. (*C.* or *P. histrionica*) is found in the n.w. parts of New South Wales in great flocks, feeding on seeds.—Some of the species of *Geophaps*, another of the genera or sub-genera of the *Columbidæ*, also are sometimes called B. W. Their partridge-like appearance and habits have gained for them the name of Partridge Pigeon (q.v.)

BRONZING: process of covering plaster or clay figures, and articles in ivory, metal, and wood, to give them the appearance of bronze. Several of the materials employed are of little value, while others are expensive. Thus, *gold powder* is used for the finer work, and is prepared by grinding gold-leaf with honey on a stone slab till a very fine state of division is attained, then washing out the honey, and drying the gold powder. Inferior gold leaf, or that which contains much silver and copper, yields the *German gold powder* employed in bronzing. *Copper powder* is prepared by introducing an iron bar or plate into a solution of copper, when the latter metal is precipitated as a finely divided red powder. *Mosaic gold*, or *musivum*, is made by fusing 1 lb. of tin, introducing ½ lb. mercury, allowing the alloy or amalgam to cool, then pulverizing and grinding up with ½ lb. sal-ammoniac, and 7 oz. sublimed sulphur. Ultimately, the whole is subjected to the process of sublimation, when the tin, as a brilliant yellow powder, resembling gold, is left in the subliming vessel. The color of mosaic gold may be deepened by the addition of red oxide of lead, and it then assumes a copper tint. *Gold size* is prepared by heating 1 lb. of linseed oil, and gradually adding 4 oz. of gum animi in very fine powder. When boiled sufficiently, it assumes the consistence of tar, and may then be strained through cloth. When employed in bronzing, some vermilion is added to make it opaque, and turpentine to make it thin and limpid enough to be easily laid on the plaster cast or other article with a brush, and the object may ultimately be rubbed over with soft chamois leather, which is occasionally dipped into the gold size. The other B. powders are

best laid on with a solution of gum arabic or isinglass, either of which acts as a cement.

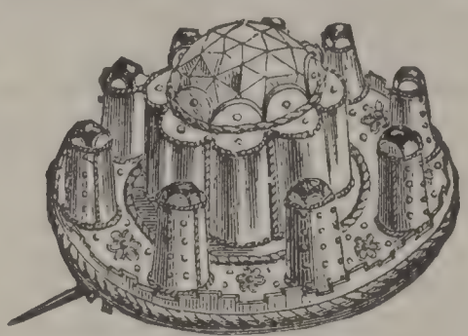
Gun-barrels are bronzed by acting upon them with the chloride or butter of antimony (*bronzing* salt), or with hydrochloric or nitric acids, when the surface of the iron is partially eaten into, and covered with a thin film of oxide; after which the gun-barrel is thoroughly cleaned, oiled, and burnished. A brownish shade is thus communicated to the barrel, which protects it from rust, and at the same time renders it less conspicuous to an enemy or to game. In the bronzing operation known as the Damascus, the barrel is treated with dilute nitric acid and vinegar, to which sulphate of copper has been added. The result is, that metallic copper is deposited irregularly over the iron surface; and when the latter is washed, oiled, and well rubbed with a hard brush, the barrel has a mottled wavy appearance. Articles in wood are first coated with a mixture of size and lampblack, and dried, and then a bronze powder, consisting of very finely divided patent yellow, raw umber, pipeclay, lampblack, and Prussian blue, is put on with a brush. After being dried again, the article is burnished with cloth or leather, covered with a layer of castile soap, and, lastly, cleaned with a woolen cloth. Copper vessels, coins, etc., are bronzed by heating them in a copper boiler containing vinegar, with 2 parts of verdigris, 1 of sal-ammoniac dissolved in it, when, after sufficient boiling, a pleasant reddish-brown hue is imparted. Bronze and copper articles may take an antique appearance by treatment with a solution of sal-ammoniac 1 part, cream of tartar 3, common salt 6, hot water 12, and more or less nitrate of copper, when an ancient greenish hue is obtained.

BROOCH, n. *brōch* [Sp. *broca*, a tack or button; *broche*, a clasp: OF. *broche*, a spit—from mid. L. *brocca*, a pointed stick (see BROACH)]: a pin or clasp to hold the parts of the

Hunterston Runic Brooch.

dress together; an ornamental jewel, with a pin fastened at one end with a hinge or joint, at the other with a hook, stuck in a woman's dress on the breast; a jewel: V. to adorn with jewels. Brooches were much used in antiquity, and

varied in form as much as in modern times They were worn both by men and by women for ornament and use, from the time of Homer to the fall of the Western Empire. In the early middle ages, and even among semi-barbarous tribes, the art of making *fibulæ* seems to have attained marvellous perfection. Many of those found in Ireland and Scotland are wonderfully beautiful in workmanship, and still more so in design: and it is doubtful whether antiquity has left us anything in the way of personal ornament more perfect than the so-called Hunterston B., of which a wood-cut is reproduced. It was found 1830, on the estate of Hunterston, in the parish of West Kilbride, Ayrshire, near the scene of a conflict which preceded the battle of Largs 1262. It is of silver, richly wrought with gold filigree, and elaborately chased with lacertine and ribbon patterns. It is set with ornaments of amber; diameter, $4\frac{9}{10}$ inches. On the reverse are runes, which have been variously read. Dr. Wilson says, 'what is decipherable reads in good Scottish Celtic into what he explains to mean—Malbritha, his friend, in recompense to Maolfridi.'—*Prehistoric Annals.* One of the most famous articles of the kind existing in Scotland is the *Brooch of Lorn*, in the possession of Macdougal of Dunolly, near Oban. It is believed to be identical with one torn



Brooch of Lorn.

from the breast of Robert Bruce by Alexander of Lorn, the ancestor of Macdougal, in a personal contest with the king. This interesting article is of silver, about 4 inches in diameter, with a circle of jewelled obelisks.

BROOD, v. *brôd* [AS. *brod*, a brood: Dut. *broeden*, to sit on eggs: W. *brwd*, hot (see BREED)]: to sit over, as a bird over her eggs: to spread over as with wings: to dwell on a subject in anxious thought [Gael. *bruad*, a dream]; to cherish: N. offspring; progeny; the number of birds hatched at a time. BROOD'ING, imp.: ADJ. sitting over, as a hatching hen; spreading over, as wings; continuing in gloomy or anxious thoughts over. BROOD'ED, pp. BROOD-MARE, a mare kept for breeding.

BROOK, n. *brûk* [AS. *broca*, a brook: W. *bruchen*, the bubbling or springing up of water: Gael. *bruich*, to simmer: Dut. *broek*, a marsh]: a small stream of water; a streamlet. BROOK'LET, n. *-lĕt*, a small brook. BROOKY, a. *brûk'i*, abounding in brooks. BROOK-LIME (*Veronica Beccabunga*), species of Speedwell (q.v.) abundant in ditches, water-courses, and wet places near springs in most parts of

Europe and in the United States. It is perennial, with procumbent stems, rooting at the base; the leaves on short stalks, elliptical, obtuse, and slightly serrate, both stems and leaves smooth and very succulent; the small blue flowers, in form resembling those of the other speedwells, in racemes, the stalks of which arise from the axils of the opposite leaves. The leaves and young shoots have a bland or a slightly bitter taste, and are a tolerable ingredient in spring salads. They are sometimes sold with water-cresses. —See CRESS, WATER.—In Scotland, the plant is called *Water Purpie.*

BROOK, v. *brûk* [AS. *brucan,* to use, to enjoy: Icel. *bruka,* to use: Goth. *brukjan;* Ger. *brauchen,* to use]: to bear; to endure; to put up with. BROOK'ING, imp. BROOKED, pp. *brûkt.*

BROOKE, *brûk,* HENRY: 1708–83; b. in the house of Rantavan, county Cavan, Ireland: dramatist and novelist. His father was a wealthy clergyman. Young B. was first sent to school to one Felix Somerford, where he showed talent for rhyming. This received development while he resided at Dr. Sheridan's school in Dublin. In 1724, he went to study law in London, and became the friend of Pope and Lyttleton. From this brilliant literary society he was recalled to Ireland by a dying aunt, who left him guardian of her child, a girl of 12 years. B. put the child to a Dublin boarding-school, and married her secretly two years thereafter. Four or five years subsequently, when his wife had borne him three children, he removed to London, and renewed his literary associations. In London, he published a poem, entitled *Universal Beauty,* which Pope admired, and of which he perhaps turned a couplet here and there. Shortly afterward, B. returned to Ireland; but in 1736 he was again in London, and was introduced to the Prince of Wales, who cultivated his friendship, and made him presents. About this time, he published his play, entitled *Gustavus Vasa,* full of noble sentiments and inconceivable characters. In 1740, B. was taken ill, and returned to his native country, where he published several books, and a tragedy *The Earl of Westmoreland,* which was performed in Dublin. In his later years he removed to Dublin, and died there. The sonorous eloquence of his plays has not saved them from oblivion; and his novel, entitled *The Fool of Quality,* is his only work likely to meet the eyes of modern readers. It was originally published in five vols., and was greatly admired by John Wesley. A new edition was published 1859, with a preface by the Rev. Charles Kingsley.

BROOKE, SIR JAMES, Rajah of Sarawak, and Governor of Labuan: 1803, Apr. 29—1868; b. Coombe Grove, near Bath. B. was naturally imbued with the spirit of the adventurers of the Elizabethan time. He early entered the East India army, was seriously wounded in the Burmese war, and returning home on furlough, spent some time in travel on the continent. Shipwrecked on the voyage out to join his regiment, he was unable to reach India before his fur

rough had expired; his appointments consequently lapsed, and he quitted the service. He now conceived the idea of putting down piracy in the Eastern archipelago, and of carrying civilization to the savages inhabiting these islands. He purchased a yacht, which he manned with about 20 sailors, and after a three years' cruise in the Mediterranean, to test the sea-worthiness of his vessel and the seamanship of his crew, sailed from London for Sarawak, a province on the n.w. coast of Borneo, 1838, Oct. When he arrived there, Muda Hassim, the uncle of the sultan of Borneo, was engaged in a war with some rebel tribes. B. lent his assistance, and in return had the title of Rajah and Governor of Sarawak conferred upon him, the native governor being forced to resign. B. immediately set about reforming the government, instituted free trade, and framed a new code of laws. The murderous custom of head-hunting, prevalent among the Dyaks, he declared to be a crime punishable with death, and vigorously set about the extirpation of piracy. This was done so draconically as to occasion great dissatisfaction in this country; and the result was that parliament abolished the 'head-money' that had been previously paid for the slaughter of pirates. Certain charges, however, brought against B. in the house of commons, in connection with this matter, were declared by a royal commission to be unsubstantiated. The head-money was received, not by B. and his associates, but by the British ships-of-war that had co-operated with him. On his return to England, B. received a warm welcome, was created a Knight Commander of the Bath in the year following; and the island of Labuan, near Sarawak, having been purchased by the British govt., he was appointed gov. and commander-in-chief, with a salary of £2,000 a year. In 1857, B., who had been superseded in the governorship of Labuan, but who still acted as rajah of Sarawak for the sultan of Borneo, was attacked at night in his house by a large body of Chinese, who were irritated at his efforts to prevent opium smuggling, and only escaped with his life by swimming across a creek. The Chinese committed great havoc on his property, but their triumph was short-lived. B. collected some natives, attacked the Chinese, defeated them in several successive fights, and ultimately forced them into the jungle, where they must have perished of starvation. Upward of 2,000 Chinese were killed, and all their flourishing settlements destroyed. Returning to England soon after this, B. lectured in several of the chief towns on the advantages likely to result to that country from a possession of Sarawak, and urged the desirableness of the British government taking it under its protection, as otherwise it was likely to fall into the hands of the Dutch. To enforce this view, an influential deputation waited upon the Earl of Derby (then head of the govt.) 1858, Nov., but he declined to entertain it. B. returned to Borneo 1861, but visited England again twice before his death, on the second occasion having the satisfaction of seeing the independence of Sarawak recognized by the English government. The town prospered greatly under his régime; he found it a

place of some 1,000 inhabitants, he left it a town, of 25,000; and the exports to Singapore, which, 1840, amounted to £25,000, were in 1858, £300,000. Brooke's biography appeared 1877.

BROOKE, John Rutter, American military officer: b. Pottsville, Pa., 1838, July 21. He entered the army as captain in a volunteer regiment on the breaking out of the Civil War in 1861, and resigned in 1866, Feb., with the rank of brevet major-general. He became colonel in 1879, March, brigadier-general, 1888, April 6, and major-general, 1897, May 22. After the declaration of war against Spain, he was placed in command of the 1st Provisional Army Corps, and subsequently distinguished himself in the campaign in Porto Rico, and was made a member of the joint military commission to arrange the cession of the island to the United States. On 1898, Dec. 13, he was appointed military and civil governor of Cuba, a post which he held till 1900, April, when he was succeeded by Gen. Leonard Wood. On May 10, following, he succeeded Maj-Gen. Wesley Merritt as commander of the Military Department of the East, with headquarters in New York. He was retired on 1902, July 21.

BROOKE, Stopford Augustus, English clergyman and author: b. Letterkenny, Donegal, Ireland, 1832, Nov. 14. After a brilliant course at Trinity College, Dublin, he was ordained in the Anglican Church in 1857. From that year till 1859 he officiated as curate of St. Matthew's, Marylebone (London); and in 1876, after having held various other clerical appointments, he became minister of Bedford Chapel, Bloomsbury, where he officiated till his retirement from regular ministerial work in 1894. In 1872 he was appointed one of the chaplains-in-ordinary to the queen. Having become a Unitarian in his views, he left the Church of England in 1880, but till 1894 still continued to occupy the same pulpit, Bedford Chapel being private property. He has gained a high reputation as a preacher and writer on religious subjects, and also as a poet, but more especially as a literary critic and historian of English literature. His chief works are *Life and Letters of the Late Frederick W. Robertson of Brighton* (1865); *Christ in Modern Life* (1872); *Theology in the English Poets* (1874); *Primer of English Literature* (1876), an admirable little work; *Riquet of the Tuft* (1880), a love drama; *The Early Life of Jesus* (1888); *Poems* (1888); *History of Early English Literature: from Its Beginning to the Accession of Alfred* (1892), the only work in English treating adequately its special subject; *Tennyson: His Art and Relations to Modern Life* (1894); *The English Poets from Blake to Tennyson* (1894); *Jesus and Modern Thought* (1894); *The Old Testament and Modern Life* (1896); *The Gospel of Joy* (1898); *Life and Writings of Milton; Poetry of*

Robert Browning (1902); besides several volumes of sermons.

BROOKES, Joshua: 1761–1833: English surgeon and anatomist. He became so widely known and celebrated through his profound knowledge of the science of surgery and anatomy that it is said the number of his pupils reached 7,000. Besides the publishing of numerous books, of which his *Treatise on Osteology* was probably the most important, he founded an anatomical museum of great value.

BROOK-FARM ASSOCIATION of Education and Agriculture: a community which originated 1841, with William Henry Channing, George Ripley, and Sophia, his wife, with whom were united from time to time George William Curtis, Nathaniel Hawthorne, Theodore Parker, Charles Anderson Dana, John Sullivan Dwight, Margaret Fuller, and other personages of a philosophic turn of mind. It started as an expression of the transcendentalism then attracting philosophical minds in the region of Boston, and as a suggestion from the Fourier communistic movement in Europe, and much shaped by the religious differences which excited New England 1825–45. The dominating idea of the Brook Farm experiment was liberty: it was a practical protest against the long-dominant Calvinism. An organization was formed, having those named and others as stockholders, and a farm of abt. 200 acres was purchased in West Roxbury, 8 m. from Boston, where the transcendentalists who adopted its main principle, carried it into practice by working the land to the best of their ability and knowledge, which, however, were limited. The actual life of Brook Farm was, reverentially, planned on the theory that Christ had designed to re-organize society, and that any effort in that direction would be worthy and acceptable to Him. The intellectual plan of the undertaking covered such intellectual objects as would be expected from the brilliant minds included in the community. In this regard it was doubtless successful—so long as it existed. That it ceased to exist, after five or six years, was due to the utterly unpractical natures of those engaged in the enterprise, which was finally abandoned after having been a financial failure from the beginning. The scheme of the association contemplated utilizing the labor—physical and intellectual—of each of its members, at a certain fixed rate, the intention being to dispose of the results of such labor to the outside public, and with such profit that all the delights and adornments of life were to be procurable therefrom, which were to be held in common by the members of the association. This part of the plan failed; and the community, having definitely gone over to Fourierism about 1843, and to Swedenborgianism a year later, engaged in a general proselytizing undertaking, a search

both for converts and capital, prosecuted by lecturers and writers. But the whole undertaking was brought to a collapse, by the destruction of the 'Phalanstery' at Brook Farm, by fire, on the night of 1846, March 3.

BROOKFIELD: a town of Fairfield co., Conn., in the town of Brookfield on the Housatonic railroad, and near the Housatonic river, which bounds the township on the n.e. It has cutlery and hat factories and several churches. Pop. (1900) 1,046; (1910) 1,101.

BROOKFIELD: town of Worcester co., Mass., on the Boston and Albany railroad. The Chicopee river divides the town, which contains 5 churches, factories for the manufacture of carriages and shoes, a savings bank, and a high school. Pop. (1910) 2,204.

BROOKFIELD: city of Linn co., Mo., on the Yellow creek. It is entered by the Hannibal and St. Joseph and the Burlington and Southwestern railroads, which have here a roundhouse and machine shops. The mining of coal is an important industry. The town has a costly school edifice, 5 churches, and 2 hotels. Pop. (1900) 5,484; (1910) 5,749.

BROOKHAVEN: Miss., a city and county-seat of Lincoln co.; on the Illinois C. R.R.; 56 m. s. of Jackson, the state capital. It is the seat of Whitworth Female College (Methodist) one of the most popular educational institutions in the South, and St. Francis School (Roman Catholic), and is the trade centre for a large farming, cotton, and yellow pine lumbering region. An electric light and power plant is owned by the city. Pop. (1910) 5,293.

BROOK'ITE: a mineral only known in the form of orthorhombic crystals. It is an oxide of titanium, having the formula TiO_2. It is found in a variety of colors, red, yellow, black, and brown. It has a hardness of 5.5 to 6.0, and a specific gravity of 3.9 or 4.0. It occurs in Switzerland, in the Tyrol, and in Wales. In the United States it is found (in stout black crystals known as 'arkansite') at Magnet Cove, Ark.; also at Paris, Maine, in Ulster co., N. Y., and in North Carolina. The mineral was named for the English mineralogist, H. J. Brooke.

BROOKLINE: Mass., a town in Norfolk co., on the Charles river, and the Boston & A. R.R.; three m. w. of Boston, with which it is connected by electric railroad. It contains the villages of Cottage Farm, Longwood, and Reservoir Station; has a granite town house, public library (64,000 volumes), and manufactories of electric motors, and philosophical instruments, but is chiefly a place of suburban residence, being the most beautiful and wealthy suburban town in the country. It was first settled in 1634, and was known as 'the hamlet of Muddy River' until its incorporation as Brookline in 1705. Pop. (1910) 27,792.

BROOKLYN.

BROOKLYN, N. Y.: the second largest of the five boroughs of New York city. It includes the entire area of the county of Kings and was, until 1898, when it was consolidated with New York, the fourth largest city in point of population in the United States. It covers the western extremity of Long Island, and has an area of 77.52 sq. m., extending from the East River, an arm of the sea which separates it from the borough of Manhattan, the old city of New York, to the Atlantic Ocean and to Newtown Creek and Queens County on the east. Its extreme length from Newtown Creek to Brighton Beach, on the Atlantic shore, is 11 miles, and its average width is over 7 miles. It appears to have been formed by nature to be the site of a great city, for so many natural advantages are rarely to be found within a similar area for the building up of a great industrial and commercial community. Since 1860 Brooklyn has advanced in population more rapidly than any other American city, although the period of its most rapid growth dates from the opening of the first bridge across the East River in 1883. Its large territorial area, much of which is still devoted to market gardening, must, for many years to come, keep the cost of a home within the resources of people of moderate means, especially as regards the outlying sections, which are thoroughly covered by electric railways. The character of the soil and the freedom from any rocky hills makes nearly every foot of ground admirably suited to building purposes. The greater part of the borough is situated at a considerable elevation above tide-water. A low range of sand-hills, from 50 to 200 feet high, runs north and east through its centre, which slopes gently down on both sides to the East River and the Atlantic Ocean.

The natural configuration of the site simplifies drainage and other similar municipal problems to a material extent, while the location of the borough, between ocean, river, and bay, mitigates the extremes of winter cold and summer heat, and makes it a desirable place of residence throughout the year.

Its advantages as a centre of commerce and industry are no less than those which made it famous as a city of homes before its consolidation with the metropolis. Its water-front available for shipping comprises two miles on Newtown Creek, including its basins, and nearly 10 miles on the East River and New York Bay. The construction of large docks, such as those of the Atlantic and Erie basins—the latter being the chief point of entry of the canal barges that bring great cargoes of grain from the distributing centre at Buffalo to the Brooklyn grain-elevators—have largely increased the wharfage facilities of the borough.

Most large cities grow by the absorption of outlying suburbs and adjacent villages, and in this respect the experience of Brooklyn has been striking. The name

of Brooklyn, which was derived from the town of Breucklen, in Holland, the home from which came most of the earliest settlers, was first attached to a small trading-village that grew up on the shores of the East River near what is now the Fulton ferry to Manhattan. There were several other villages in the county which for a long time retained their individuality and developed along their own lines. Across the Wallabout swamp, to the eastward—'Wallabout' being derived from a settlement of Walloons—a village was laid out in 1827 which was incorporated under the name of Williamsburg and in 1851 became incorporated as a city. Then Williamsburg swallowed up the older and adjacent villages of Bushwick and Greenpoint, just as Brooklyn had already swallowed up Bedford and Gowanus. In 1854 Brooklyn and Williamsburg were consolidated. The town of New Lots, including the village of East New York, came next, and the work of absorption, as far as Brooklyn was concerned, was completed in 1894, when the towns of Flatbush, New Utrecht, Gravesend, and Flatlands were made part of the city, the corporate limits of which then included all of Kings County. It was a natural process, but usually, when a large city is surrounded by suburbs that are destined to absorption, the lines of development of the suburbs are indicated and set in accordance with their inevitable destiny, and annexation entails no confusion. It was different with Brooklyn. Williamsburg, Flatbush, Canarsie, Bushwick, and East New York—more than 20 villages and hamlets all told, that are now a part of the borough of Brooklyn—had each its own plan and its own system of nomenclature. The result has been hopeless and to a large extent irremediable confusion. Duplication of street names may be corrected by the substitution of new names for the old, and much has already been done in that direction, but the confusion resulting from the multiplicity of independent plans on which the various parts of the borough were originally laid out have never been wholly corrected, and Brooklyn will continue to be a puzzle to strangers and even to old residents.

It is as a city of homes—of middle-class homes—that Brooklyn has gained its distinctive character among American cities. The very wealthy can afford to live in Manhattan, and the very poor have no alternative but to crowd into its hive-like tenements, but it may be said that, as a rule, the palace and the tenement—using the latter word in its ordinary, not its technical sense—are alike unknown in Brooklyn. No place of like population is freer from those congregations and nurseries of crime and disease known as 'slums,' and in no city is a larger proportion of the population housed under decent and sanitary conditions. It is for this reason, and because the growth of Brooklyn has kept pace in other respects with its growth in numbers, that the population increased from 279,122 in

1860 to 599,495 in 1880; 1,166,582 in 1900, and 1,634,351 in 1910.

The earliest settlement of the Dutch in Kings County was made in 1619, but it was not until more than a century later that Brooklyn had any organized existence. It was the scene of Washington's first battle and defeat during the American Revolution. That battle was fought only about six weeks after the American Congress in Philadelphia had adopted the Declaration of Independence. Washington's army, as yet raw and totally unused to warfare, was massed among Brooklyn's hills, while Gen. Howe, with 30,000 seasoned fighting men, occupied Staten Island. The British crossed to Long Island, landing on the plains of New Utrecht, and on the morning of 27 Aug. 1776, a general advance was made on the American lines. The attack was made at three points. One division advanced through the marshes of Gowanus, and, despite a gallant resistance, drove back the Maryland regiment to the main body of American troops. A second point of attack was through what is now known as Battle Pass, in Prospect Park, where the Americans were forced back on the entrenched position at Fort Green, but the heaviest blow was struck through the advance of a strong flanking party. It had early that morning passed along the northern base of the ridge of hills in what is now the Twenty-fourth ward, stopping at the Howard House, a tavern in East New York, and impressing its owner as a guide. It then advanced upon Washington's forces from the east. A misty night fell, with no general engagement, and by morning Washington had withdrawn his troops, under cover of fog, across the East River. The British retained possession of Brooklyn until the evacuation of New York at the close of the war. Brooklyn's most memorable association with Revolutionary history, however, lies in the fact that the British prison ships—the *Jersey* and its consorts—were moored in Wallabout Bay, and the bones of 11,000 victims of British severity who died in those floating slaughter-pens are buried at Fort Green, where a worthy monument to their patriotic devotion has been erected.

Brooklyn was incorporated as a village in 1801, and at about that time the federal government made its first purchase of land at the Wallabout for navy-yard purposes. The Brooklyn navy-yard is now the best equipped in the possession of the U. S. government. It covers an area of over 100 acres, with a capacious dry-dock, and a mechanical plant capable of ship-building on the most extensive scale. Some of the finest ships in the United States navy have been constructed here, and its great repair shops are kept constantly at work. A splendidly equipped naval hospital occupies a fine site in connection with the yard.

Brooklyn village was incorporated as a city in 1834, with George Hall as its first mayor. In 1854 came

consolidation with Williamsburg, and thereafter the growth of the city was steady and rapid. Street railway enterprises opened highways through outlying farm districts, and these speedily became transformed into great thoroughfares, and Brooklyn has now 713 miles of streets, of which the principal ones are paved with asphalt.

The surface and elevated railroad lines, all operated by electricity, have more than 550 miles of tracks, and in 1905 carried nearly 400,000,000 passengers. The growth of Brooklyn, so largely accelerated by the bridge opened in 1883, seems likely to be further stimulated by the early completion of the two additional bridges now in course of construction. The tunneling of the East River, under direction of the New York Rapid Transit Commission, will also tend materially toward Brooklyn's further growth. This tunnel crosses from Battery Park in New York to Fulton street and passes thence under the entire city.

It has been generally assumed that Brooklyn is merely 'the sleeping-place of Manhattan.' It is undoubtedly true that many thousands of those who are engaged in business in Manhattan find their homes in Brooklyn—the number has been estimated at between 65,000 and 100,000; but the fact remains that Brooklyn itself is one of the greatest manufacturing centres of the United States. In many important branches of industry it leads all its competitors. Its most important industry, at the time of the last census, was foundry and machine-shop products, in which there was $13,725,518 invested, and wages to the amount of $5,641,132 were paid to 7,753 workmen. Brooklyn's sugar-refining industry is by far the most important in the United States, nine-tenths of the sugar consumed in the country being refined here. In this and in the closely allied coffee-roasting industry, the amount of capital invested is nearly $20,000,000, the annual value of the finished product being, sugar, $16,629,982; coffee, $12,247,162. The manufacture of chemicals is another industry in which much capital is invested, and in which 2,984 people find employment. Some of the leading publishers of the United States have located their printing and bookbinding establishments in Brooklyn. It is also the seat of jute manufacture, glass and porcelain factories, cordage works, and other important industries.

Brooklyn's public-school system, up to the date of consolidation with New York, held a high place in the esteem of public educators. In 1897 it was merged in the public-school system of the greater city, but it still possesses many of the characteristics that formerly distinguished it, and few if any cities in the world have better equipped public schools. It has six high schools, of which one is devoted to manual and technical instruction, while another is wholly given over to commercial instruction. Its 133 grammar schools are crowded al-

most beyond their capacity every day in the school year. Many of the schools in the poorer neighborhoods are kept open during the summer months as recreation schools for the benefit of children who remain in the borough during the ordinary school vacation, and who are taught many things outside of the ordinary school curriculum.

Brooklyn has no university, but it has many excellent private schools and academies, some of which, such as the Polytechnic Institute, Adelphi Academy, and St. John's College, hold collegiate rank and may grant degrees. The parochial schools also hold high rank, while the Pratt Institute affords thorough technical training to hundreds of pupils.

The Brooklyn Public Library, with which the excellent Brooklyn Library has recently been incorporated, maintains an extensive system of branch libraries throughout the borough; and when this is supplemented by the system of libraries recently presented by Mr. Andrew Carnegie, no community in the United States will be better equipped in this direction.

One of the most notable of the educational institutions in Brooklyn is the Brooklyn Institute of Arts and Sciences. This valuable and practically unendowed institution is, as regards its present buildings, situated upon high ground adjacent to Prospect Park, on what is known as the East Side Park lands, of which $11\frac{9}{10}$ acres have been leased to the trustees for 100 years. It is the development of a school of arts and sciences founded during the middle of the 19th century by Augustus Graham, a philanthropist of English extraction. It has expanded under the direction of Prof. Franklin W. Hooper and a public-spirited board of trustees into what is likely to prove the nucleus of a great national academy. It already has a well-furnished museum, which is especially rich in prehistoric American relics, and departments of archæology, architecture, astronomy, botany, chemistry, domestic science, electricity, engineering, entomology, geography, geology, law, mathematics, microscopy, mineralogy, music, painting, pedagogy, philology, philosophy, photography, physics, political science, and psychology, each of which is presided over by an expert in the science.

Brooklyn's public park system has been developed on a scale altogether commensurate with the character of the borough, and full advantage has been taken of the cheapness of land to make provision for the needs of the future in the matter of breathing places and pleasure grounds. The oldest and best known, although not the largest of these, is Prospect Park, which includes 516 acres of rolling land, with picturesque lakes and an unrivaled growth of old forest trees. Prospect Park is beautifully laid out, special care having been taken during the 45 years of its existence as a park to preserve its natural characteristics. Its statuary includes figures of J. S. T. Stranahan, one of the pioneers in

the matter of providing public parks; John Howard Payne, Thomas Moore, Washington Irving, Beethoven, and Mozart. There is also, at the foot of Lookout Hill, a memorial shaft in honor of the Maryland soldiers who fell in the battle of Long Island.

Fulton St., which begins at the river front on the western side of the city near the Brooklyn Bridge and runs the entire length of the city, is the principal business thoroughfare. At the junction of Court, Montague, Washington Sts. and Myrtle Ave. are a cluster of municipal buildings, including the Borough Hall (in front of which stands the statue of Henry Ward Beecher), the Hall of Records and Municipal Building, and directly opposite on Court St. are the Temple Bar, Mechanics Bank, Dime Saving Institution buildings and other large structures used for mercantile offices. On Montague St. are the Art Association Building, and the Brooklyn Library, and in this vicinity on the Heights are the Hamilton Club, the building of the Long Island Historical Society, the famous Plymouth Church, the Church of the Pilgrims, the Church of the Holy Trinity and the Brooklyn Bank. On Washington St., e. of Fulton St., are the post-office, and the fine office building of the Brooklyn Daily Eagle. Located near the municipal buildings are the Packer and Polytechnic Institutes; further e. on Fulton St. are the great dry-goods establishments which form one of the most compact shopping districts in the world; the Central Y. M. C. A. with its Association Hall; the Y. W. C. A., and several theatres. Other notable buildings are the Pratt Institute, with its large library building in Ryerson St.; the 13th Regt. Armory on Sumner Ave., the 23d Regt. Armory and the Union League Club on Bedford Ave., the Rom. Cath. Cathedral, the Naval Branch Y. M. C. A. building, the Brooklyn, Seney, Long Island and other hospitals, and many private and public clubs and charitable institutions. On Wallabout Bay is the U. S. Navy Yard, which altogether covers about 140 acres, and contains, beside the barracks, machine shops, docks, parade grounds, etc., a large Naval Hospital. Adjoining this is Wallabout Market, one of B's most important centres of produce trade.

Another notable pleasure ground is Brooklyn Forest, which includes 536 acres on the crown of the ridge of hills on the Queens County border. Except for the laying out of walks and paths it has been left in its natural state. It affords splendid views of the Atlantic Ocean and Jamaica Bay, Sunset Park, a reserve of 14 acres on the shores of New York Bay, and the Coney Island Concourse, which runs along the Atlantic shore and contains 70 acres, are unique in their location. In addition there are nearly 40 small parks and recreation grounds in the borough. The system of parkways and boulevards under the care of the park department covers 42 miles of well-paved roadways, to which additions are constantly being made.

BROOKS, *brûks*, CHARLES SHIRLEY: novelist and journalist, 1815–74; b. Brill, Oxfordshire, Eng., son of William B., architect. He was educated chiefly by the Rev. T. J. Bennett, canon of St. Paul's; and leaving school, was articled to an attorney. He passed with distinction the examination in the Law Society's Hall; but soon adopted literature as a profession, in London. He wrote dramas—*Our New Governess, Honors and Tricks, The Creole, The Daughter of the Stars;* and he contributed to some leading periodicals and journals. He became writer of the Parliamentary Summary for the *Morning Chronicle,* for which journal he went to Russia, Syria, and Egypt, to report on the condition of labor and the poor in those countries. B. was a contributor to *Punch* from its beginning. The 'Essence of Parliament' in *Punch* is said to have been his regular contribution. He also wrote for it *Miss Violet and her Offers, The Naggletons,* etc. Brooks contributed political and other articles to the columns of the *Illustrated London News.* His novels are *Aspen Court, The Gordian Knot, The Silver Cord* (originally published in *Once a Week*), and *Sooner or Later.* Brooks was the author of *The Russians of the South.* He gained repute as a lecturer. On the death of Mr. Mark Lemon, 1870, B. became the editor of *Punch.* A volume of his *Wit and Humor* appeared 1875.

BROOKS, *brûks,* CHARLES TIMOTHY: 1813–83; b. Mass.; graduated at Harvard, 1832; became Unitarian minister at Newport, R. I., 1837. He made numerous translations from different German authors; among them are: Schiller's *William Tell* (1838); *Homage of the Arts* (1847); *German Lyrics* (1853); and Goethe's *Faust* (1856). He is also author of *Aquidneck* (1848); *The Controversy touching the Old Stone Mill* (1851); *Songs of Field and Flood* (1854); a collection of sermons, etc.

BROOKS, ELBRIDGE STREETER: American author; b. Lowell, Mass., 1846, April 14; d. Somerville, Mass., 1902, Jan. 7. He was the author of more than 40 books for young people, intended to familiarize them with American history, among which are *Historic Boys; Chivalric Days; The Story of the American Indian; The Story of New York; Heroic Happenings* (1893); *The True Story of George Washington* (1895); *The Century Book of Famous Americans* (1896); *Stories of the Old Bay State* (1899); *A Godson of Lafayette* (1900); *Under the Allied Flags* (1901). He edited the *Wide Awake Magazine* for several years, and was the literary adviser of the Boston publishing house of D. Lathrop Company from 1895 until his death.

BROOKS, JAMES: 1810–73; b. Portland, Me.: journalist. After graduating at Waterville, he studied law at Portland for a time. In 1832 he went to Washington as correspondent of the *Portland Advertiser,* and

thus introduced the fashion of regular Washington correspondence. After that he traveled in Georgia, and wrote interesting letters from the Creek, Cherokee, and Choctaw country. As a member of the Maine legislature, 1835, he offered the first proposition for a railroad from Portland to Montreal and Quebec. When the legislature adjourned, B. went to Europe to travel on foot, writing back descriptive letters. On his return, 1836, he established the *New York Express*, which soon became one of the leading newspapers of the country. In 1847 he was a member of the New York state legislature, and in 1849 was elected to congress. In 1850 he favored the Clay compromise measures; in 1854 he entered the American party, and in 1861 the democratic party by which he was soon afterward sent to congress, where he remained three terms. In 1873 the house censured Mr. Brooks for the use of his position of government director of the Union Pacific railroad and a member of this house to procure the assignment to himself or family of stock in the Credit Mobilier. His remarkable faculty for keen observation is especially noticeable in his Washington and Georgia letters and in his *Seven Months' Run up and Down and Around the World*, an account of his travels in 1872.

BROOKS, James Gordon: American poet; b. Claverack, N. Y., 1801, Sept. 3; d. Albany, 1841, Feb. 20. He studied law, and removed in 1823 to New York, where he became editor of the *Minerva*, a literary journal, and afterward of the *Literary Gazette*, the *Athenæum*, and the *Morning Courier*, continuing in all these papers the publication of his verses. In 1828 he married Mary Elizabeth Aikin, who had written under the signature of Norma, and the next year appeared the *Rivals of Este, and Other Poems, by James G. and Mary E. Brooks.*

BROOKS, John: American soldier, and governor of Massachusetts; b. Medford, 1752; d. 1825, March 1. While pursuing the study of medicine he displayed a love for military exercises, and having settled as a medical practitioner at Reading undertook the drilling of a company of minute men, with whom, on the news of the expedition to Lexington, he marched in time to see the retreat of the British. Promoted soon after to the rank of major in the Continental service, he assisted in throwing up the fortifications on Breed's Hill, and was especially serviceable to the army as a tactician. He was made lieutenant-colonel in 1777, and in the battle of Saratoga stormed the intrenchments of the German troops. He was a faithful adherent of the commander-in-chief during the conspiracy at Newburg. Washington requesting him to keep his officers within quarters, that they might not attend the insurgent meeting, his reply was: 'Sir, I have anticipated your wishes, and my orders are given.' Washington took him by the

hand, and said: 'Col. Brooks, this is just what I expected from you.' After the peace he resumed the practice of the medical profession in Medford, and was for many years major-general of the militia of his county. In the War of 1812 he was adjutant-general of Massachusetts, and in 1816 was elected governor of that state, an office to which he was re-elected annually till 1823, when he declined being again a candidate.

BROOKS, JOHN GRAHAM: American lecturer on economics; b. Acworth, N. H., 1846, July 19. He was graduated from the Harvard Divinity School in 1875, and subsequently studied in the universities of Berlin, Jena, and Freiburg. He was for a time in the work of the Unitarian ministry, and was for several years a lecturer in the extension department of the University of Chicago. For two years he served as an expert in the department of labor at Washington, making a report in 1893 upon workingmen's insurance in Germany. He has published *Charity and the Unemployed; The Pope and the Encyclical on Labor; The Social Unrest* (1903).

BROOKS, MARIA GOWEN: 1795–1845; b. Medford, Mass.; d. Matanzas: poetess, called *Maria del Occidente* by Southey. Having lost her father while young, she was cared for and educated by Mr. Brooks, her future husband. After his death 1823, she moved to Cuba; visited London and Paris 1830; and Southey at Keswick 1831. She published: *Judith, Esther and other Poems* (1820); *Zophiel, or the Bride of Seven* (1825), her best work, for which she received of Southey the highest praise; *Idomen, or the Vale of Yumuri; Ode to the Departed;* etc.

BROOKS, NOAH: American journalist and author; b. Castine, Maine, 1830, Oct. 30; d. Los Angeles, Cal., 1903, Aug. 16. From 1850 he was connected with newspapers in Massachusetts. California, Washington, and New York. He published many popular books for boys, among which are *The Fairport Nine* (1880); *Our Baseball Club* (1884); *How the Republic is Governed; American Statesmen* (1893); *Short Stories in American Party Politics* (1896); *The Boys of Fairport; The Mediterranean Trip.*

BROOKS, PETER CHARDON: American merchant; b. Medford, Mass., 1767, Jan. 6; d. Boston, 1849, Jan. 1. He began his business career as secretary in a marine insurance office in Boston, and presently became its principal. He rapidly acquired a fortune, retiring in 1803, and for the remainder of his life took an active interest in municipal and philanthropic affairs. He was the president of several benevolent associations, a member of the first city council of Boston, and sat in both houses of the State legislature. He was one of the most prominent opponents of the lottery schemes then countenanced by many respectable persons.

BROOKS, PHILLIPS: American Protestant Episcopal bishop; b. Boston, Mass., 1835, Dec. 13; d. there, 1893, Jan. 23. Born at a time when the orthodox faith was fighting its bitterest battle with Unitarianism, his parents accepted the dogmas of the new theology, and had him baptized by a Unitarian clergyman. But while refusing certain dogmas of the orthodox church they were the more thrown back for spiritual support upon the internal evidences of evangelical Christianity. Transition to the Episcopal Church was easy; the mother became an Episcopalian, and the future bishop received all his early training in that communion. But heredity had its influence, and in after life he declared that the Episcopal Church could reap the fruits of the long and bitter controversy which divided the New England Church only as it discerned the spiritual worth of Puritanism, and the value of its contributions to the history of religious thought and character. He entered Harvard, and graduated with honor in 1855, and soon after entered the Episcopal Theological Seminary at Alexandria, Va. The transition from Harvard to this college was an abrupt one. The standards of the North and South were radically different. The theology of the Church in Virginia, while tolerant to that of other denominations, was uncompromisingly hostile to what it regarded as heterodox.

When the Civil War was declared he threw himself passionately into the cause of the Union. Yet his affection for his southern classmates, men from whom he so widely differed, broadened that charity that was one of his finest characteristics, a charity that respected conviction wherever found. No man, in truth, ever did so much to remove prejudice against a Church that had never been popular in New England. To the old Puritan dislike of Episcopacy, and distrust of the English Church as that of the oppressors of the colony, was added a sense of resentment toward its sacerdotal claims and its assumption of ecclesiastical supremacy. But he nevertheless protested against the claim by his own communion to the title of 'The American Church,' he preached occasionally in other pulpits, and even had among his audiences clergymen of other denominations.

His first charge was the Church of the Avent, in Philadelphia; in two years he became rector of Holy Trinity Church in the same city. In 1869 he was called to Trinity Church, Boston, of which he was rector until his election as bishop of Massachusetts in 1891.

It is impossible to give an idea of Phillips Brooks without a word about his personality, which was almost contradictory. His commanding figure, his wit, the charm of his conversation, and a certain boyish gayety and naturalness, drew people to him as to a powerful magnet. It was said of him that as soon as he entered

a pulpit he was absolutely impersonal. There was no trace of individual experience or theological conflict by which he might be labeled. He was simply a messenger of the truth as he held it, a mouthpiece of the Gospel as he believed it had been delivered to him. His sentences are sonorous; his style was characterized by a noble simplicity, impressive, but without a touch showing that dramatic effect was strained for. He passionately loved nature in all her aspects, and traveled widely in search of the picturesque; but used his experience with reserve, and his illustrations are used to explain human life. His treatment of Bible narratives is not a translation into the modern manner, nor is it an adaptation, but a poetical rendering, in which the flavor of the original is not lost, though the lesson is made contemporary. He used figures of speech and drew freely on history and art for illustrations, but not so much to elucidate his subject as to ornament it. As might be expected of one who, in the world's best sense, was so thoroughly a man, he had great influence with young men and was one of the most popular of Harvard preachers. It was his custom for 30 alternate years to go abroad in the summer, and there, as in America, he was regarded as a great pulpit orator. He took a large view of social questions, and was in sympathy with all great popular movements. His advancement to the episcopate was warmly welcomed by all parties, except one branch of his own church with which his principles were at variance, and every denomination delighted in his elevation as if he were the peculiar property of each. His works include *Lectures on Preaching* (1877); *Sermons* (1878–81); *Bohlen Lectures* (1879); *Baptism and Confirmation* (1880); *Sermons Preached in English Churches* (1883); *The Oldest Schools in America* (Bos. 1885); *Twenty Sermons* (N. Y. 1886); *Tolerance* (1887); *The Light of the World, and Other Sermons* (1890); and *Essays and Addresses* (1894). His *Letters of Travel* show him to have been an accurate observer, with a large fund of spontaneous humor. See Allen, *Life and Letters of Phillips Brooks;* Howe, *Phillips Brooks* (1902).

BROOKS, Preston Smith: American politician and legislator; b. Edgefield, S. C., 1819, Aug. 4; d. Washington, D. C., 1857, Jan. 27. He was graduated at South Carolina College in 1839; elected to the legislature of his native state in 1844; raised a company for the Mexican war and led it as captain in the famous Palmetto regiment. He was sent to congress in 1853, made his first speech in February 1854, on the subject of the Nebraska bill; speaking also in June of the same year on the Pacific railroad bill. On 1856, May 22, Senator Sumner, of Massachusetts, having employed in a speech in the senate various expressions which had greatly incensed the members of congress from South

Carolina, Brooks entered the senate chamber, after the senate had adjourned, while Sumner was seated at his desk engaged in writing, and with blows on the head from a gutta-percha cane struck the senator to the floor, where he left him insensible. On June 2 a committee of the house of representatives reported in favor of Mr. Brooks' expulsion. In the final action upon the report there were 121 votes in favor of and 95 opposed to it, which, being less than the requisite two-thirds vote, prevented the house from agreeing to the resolution. Mr. Brooks, however, resigned his seat, and, July 8, pleaded guilty before the court at Washington upon an indictment for assault, and was sentenced to a fine of $300. Having addressed his constituents on the subject of the assault, he was re-elected to congress by a unanimous vote, and made, on 1857, Jan. 7, a second speech on the Nebraska bill.

BROOKS, Shirley: see Brooks, Charles William Shirley.

BROOKS, William Keith: American zoologist; b. Cleveland, Ohio, 1848, March 25. He has been a professor of zoology in Johns Hopkins University from 1876. Among his published books are *Handbook of Invertebrate Zoology* (1882); *Heredity* (1884); *The Development and Protection of the Oyster in Maryland* (1884); *A Monograph of the Genus Salpa* (1893); *Foundation of Zoology* (1898).

BROOKS, William Robert: American astronomer; v. Maidstone, Kent, England, 1844, June 11. He was educated in the United States and in 1874 founded the Red House Observatory at Phelps, N. Y., where he discovered 11 comets. Since 1888 he has been in charge of the Smith Observatory at Geneva, N. Y., where he has discovered 13 more comets. In 1887 he was eletced a Fellow of the Royal Astronomical Society of Great Britain.

BROOM, n. *brôm* [AS. *brom:* Dut. *brem* (see Bramble)]: a wild shrub producing yellow flowers and pods; a besom or brush with a long handle, made originally of the *broom* bush. Broom-stick, *-stĭk*, the staff or handle of a broom.

BROOM: name of a number of species of shrubs of the closely allied genera *cytisus Genista*, and *Spartium;* nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*—all of them having long slender branches, along which are produced axillary flowers. It is pretty but not useful. The genera differ in the form of the standard (see Papilionaceæ), which is roundish in *Spartium*, broadly ovate in *Cytisus*, and oblongo-ovate in *Genista*, while *Spartium* has also an acuminate keel, and that of *Cytisus* is very obtuse, that of *Genista* being oblong. The legume is many-seeded in all, the calyx 2-lipped, and the filaments united in a tube. Common B.—which

has by different botanists been ranked in each of the genera just named, although it possesses the characters above assigned to *Cytisus*, but has recently been made the type of a new genus, under the name of *Sarothamnus scoparius*, or *communis*—well-known native of Britain and of the continent of Europe, growing in dry soils, and ornamenting hedge-banks, hills, and bushy places, in May and June, with its large yellow flowers, which are on short stalks, drooping, solitary, but produced in considerable number along the straight slender branchlets. The whole aspect of the plant is graceful. The lower leaves have three oblong leaflets, the upper ones, or bracts, are simple; the branches are angular and of a very dark green, very tough, and much in use for making besoms. They have also been used for tanning and dying; and their fibre has been woven into a coarse strong cloth, and even made into paper. The whole plant is very bitter, with a peculiar nauseous taste and smell when bruised. The young tops and seeds are used in medicine, being powerfully diuretic, and very beneficial in some kinds of dropsy. They are also mildly laxative, and in large doses emetic. They are administered usually in the form of a decoction. B. inhabits colder climates than furze, reaching to a greater elevation on mountains, and being found beyond the n. limit of furze. It varies in size from a very humble shrub to one of 20 or even 30 ft. in height, and when it reaches this size, the wood is of great value for the finer purposes of cabinet-makers and turners. —IRISH B. (*Cytisus* or *Sarothamnus patens*), not unfrequent as an ornamental plant in British shrubberies, is a native, not of Ireland, but of Spain and Portugal.—PORTUGAL B., or WHITE B. (*Cytisus albus*), native of the countries bordering on the Mediterranean, is often planted in Britain as an ornamental shrub, and is much admired for the beauty of its fascicled white flowers, produced upon long filiform branches. Its leaves have three leaflets. It sometimes attains a height of 15 or 20 ft.—SPANISH B. (*Spartium junceum*) is a native of the s. of Europe, growing generally in dry soils and rocky places, and attaining a height of 8 ft. or upward. Its branches are upright, round, and rush-like, a characteristic of this genus. They are smooth, and bear only a few small simple leaves, which soon drop off. The fibre of the branchlets is much used in some parts of Italy, France, and Spain for making cloth, ropes, etc. In the s. of France, the plant is cultivated on dry unproductive soils. The branchlets are made into bundles, dried, beaten, steeped and washed, in order to the separation of the fibre. It possesses medical properties similar to those of the common broom.—A white-flowered species (*S. monospermum*), grows abundantly on the loose sands of the coasts of Spain, and produces a similar fibre. It is mentioned by Barth as growing in great abundance in Africa s. of the Great Desert. There are many other species somewhat resembling these: some are cultivated in greenhouses. The Canary Isles produce some remarkable for the fragrance of their flowers. The name B. is not given to those species of *Cytisus* (q.v.) and *Genista* (q.v.) which do not display in a marked degree

the character of having long slender twigs.—BUTCHER'S B. (q.v.) is a plant of an entirely different family.

BROOM-CORN: a grass cultivated in the United States for the manufacture of brooms and whisks, which are made of the tops of the culms and the branches of the panicle. It is regarded as a mere variety of the same species (*Sorghum saccharatum*), of which the shaloo, or sugar-grass (see SUGAR-CANE and DURRA), is another variety. It has been much longer cultivated in N. America, however, than the sugar-yielding variety. Its introduction is ascribed to Dr. Benjamin Franklin, who, seeing an imported whisk in the possession of a lady of Philadelphia, found a single seed on it, and planted it. It is said to have been brought from the East Indies. It is now extensively cultivated in all parts of the country, and much capital is invested in the manufacture of brooms. The crop of B. has a beautiful appearance when near maturity, It often attains a height of 10–12 ft., sometimes 15 ft. The stalks are long and hard, and used mostly for manure, though cattle will feed on them before they are touched by frost, and cattle are very fond of the leaves. The seed is used like Indian corn, for feeding poultry, and sometimes for feeding cattle and horses. The usual practice in harvesting B. is to bend the stalks 2½–3 ft. from the ground, and leave them a few days to dry, then to cut them over 6–8 inches below the panicle, laying the tops in heaps, to be conveyed to the scraper, which is often wrought by horse-power, and which removes the seed from them. Improved machinery has recently been employed in the manufacture of brooms and whisks from B., and they are produced with great rapidity. It is supposed that, in 1860, about 10,000 acres of B. were cultivated in New York state, 9,000 in Illinois, 6,000 in Ohio, and about an equal amount in all the other states of the Union, or 30,000 acres in all; the value of the produce about $1,590,000. Great numbers of brooms and whisks of this material are exported to Britain. See BRUSHES and BROOMS.

BROOME, *bröm*, WILLIAM: 1689–1745: English poet and divine, who assisted Pope in translating the Odyssey. For translating eight books from the Greek and preparing all the notes, he received only £500 sterling and a hundred copies of the book. B. complained bitterly; and Pope, feeling sensitive about the exposure to the public took revenge by abusing B. in the *Dunciad*. Dr. Johnson bestowed great praise on Broome's abilities as a translator. He was a rector in Suffolk, England; and published a *Miscellany of Poems*.

BROOM'RAPE: see OROBANCHEÆ.

BRO'RA BEDS: series of strata at Brora, village in Sutherlandshire, of the same age as the inferior oolite of Yorkshire. They are remarkable chiefly for the occurrence in them of a seam of coal of good quality 3½ ft. thick, the thickest stratum of true coal hitherto discovered in any secondary strata in Britain,

BROSE, n. *brōz* [a softened form of *broth*: Low Ger. *broi*, boiling water; OE. *browys* and *brewis*, pottage]: a

Scotch dish, made by pouring boiling broth, or a boiling liquid over dry oatmeal or peasemeal, and then stirring it up. *Note.*—Skeat gives a Gael. *brothas*, as the origin of 'brose'; and connects the OE. n. plu. *brewis*, brose or pottage, with the OF. plu. *broues*—from *brou*—from mid L. *brodum*, gravy, broth.

BROSSES, *brŏs*, CHARLES DE: 1709, Feb. 8—1777, May 7; b. Dijon, France: historian. His first work was *Lettres sur l'Etat de la Ville d'Herculaneum*, the result of a tour through Italy, 1739. At the suggestion of his friend Buffon the naturalist, he wrote the *Histoire des Navigations aux Terres Australes* (1756), in which he described the supposed great southern continent under the several names Magellania, Australia, and Polynesia. The last two of these names, now commonly used, were employed first by Brosses. His next work was *Du Culte des Dieux Fétiches*, etc. (1760). It was followed by a *Traité de la Formation Mécanique des Langues* (1765), which, in spite of many errors, contains not a few novel and ingenious observations and conjectures. During the greater part of his life, B. was occupied in endeavoring to supply the *lacunes* in the works of Sallust; and having collected about 700 fragments by this historian, he published, with such interpolations as he deemed necessary, the *Histoire de la République Romaine dans le cours du Septième Siècle, par Salluste* (1777). At his death he was president of the parliament of Burgundy. His letters from Italy, *Italie il y a cent Ans*, were edited and republished by his son René, Count de Brosses, 1834.

BROTH, n. *brŏth* [Icel. *broth;* It. *brodo;* F. *brouet*, broth —from OF. *brou*—from mid. L. *brodum*, the gravy or extract of flesh: Dut. *broeye;* Ger. *brühe*, boiling water: Gael. *bruich*, to boil]: infusion or decoction of vegetable and animal substances in water. It is customary to use more or less meat, frequently beef or mutton, with bone, and certain vegetables, as cabbage, greens, turnips, carrots, peas, beans, onions, etc. The whole are mixed together in cold water, heat slowly applied, and the materials allowed to simmer for some hours. The meat yields up certain ingredients, while others are retained in the residual flesh. The following table will illustrate this:

Ox-flesh heated with water

Yields to the Water.	Leaves in the Boiled Meat.
Albuminous matter.	Fibrine.
Gelatine.	Coagulated albumen.
Creatine.	Gelatinous tissue.
Extractive matters or Osmazome.	Fat.
Lactic acid.	Nervous matter.
Salts.	
Fat.	
Saccharine matter.	

The vegetables yield albuminous constituents, coloring and mucilaginous matter, and volatile oils and salts.

The real nutritive material present in broth is less than is generally thought, though it aids in satisfying the appetite.

To invalids, however, the form of broth known as beef-tea (q.v.) is of great importance, as it affords the weak and sickly stomach a light palatable article of diet at a time when stronger food would do the weakened system much harm. See BROSE: NUTRITION.

BROTHEL, n. *brŏth'ĕl* [It. *bordello*, a brothel: Sp. *borda*, a hut or cottage: OF. *bordel*, a hut, dim. of *borde*, a little cottage]: a house of ill fame.

BROTHER, n. *brŭth'ėr* [Dut. *broeder;* Icel. *brothir;* Goth. *brothar*, a brother; Sks. *bhratr*—from *bhri*, to support: Gael. *brathair;* W. *brawd;* L. *frater*, a brother]: son of the same parents; one that resembles another in appearance or manners; a relation or kinsman; one engaged in the same employment, common purpose, or combination, as a brother officer—i.e., one in the same regiment; one belonging to the same order or fraternity, as a monk or freemason. BROTH'ERS, plu. BRETHREN, plu. *brĕth'rĕn*, members of the same society or profession. BROTH'ERLESS, a. BROTH'ERLIKE, a. BROTH'ERHOOD, n. an association; a fraternity. BROTH'ERLY, a *-lĭ*, becoming a brother; kind and affectionate: AD. after the manner of a brother. BROTH'ERLINESS, n. BROTH'ER-GERMAN, *-jėr'man*, or -GERMANE, n. *-jėr-mān'* [L. *germanus*, of the same stock]: a full brother. BROTHER-UTERINE, n. *-ū'tėr-ĭn* [L. *utĕrus*, the womb]: a brother by the same mother only. BROTHER-IN LAW, n., BROTHERS-IN-LAW, plu. a sister's husband; the brother of a husband or wife.

BROTH'ERHOODS, RELIGIOUS: societies instituted for pious and benevolent purposes. They were very numerous in the middle ages. Their origin is probably traceable to the desire which then prevailed to imitate the spiritual orders. They were at first founded usually without ecclesiastical authorization, on account of which several of the confraternities that either did not seek or did not obtain the recognition of the church, assumed the character of sects, and were suspected of heresy. To this class, among others, belonged the Beghards and Beguines (q.v.), the Brothers and Sisters of the Free Spirit (see below), the Apostolic Brethren (q.v.), the Flagellants (q.v.), who, tolerated by the church for a while, at last incurred its displeasure, and were severely persecuted. Among religious B. may be reckoned also the old building corporations from which sprang the order of Freemasons, the religious character of whose secret societies indicated, in the opinion of the church, a peculiarly dangerous gnosis and symbolism. Others coming into existence under ecclesiastical oversight, or at least confirmed by the church, had no *arcana*, but were simply dedicated to the promotion of religion, either by the imposition of new penances, the acceptance of new and severer devotions, or the assisting of strangers, travellers, the unprotected, the oppressed, the destitute, and the sick. Admiration and approval cannot be refused to such self-denying fraternities in view of the deficiency of the early communities in charitable institutions. The B. were

most numerous in Italy, Rome alone having more than a hundred.

Brothers and Sisters of the Free Spirit, a sect which sprang up in the Rhine country during the 13th c., and afterward spread into France and Italy. It grounded its peculiarities on the biblical doctrine, that the Holy Spirit is a spirit of 'freedom.' Misunderstanding the true nature of spiritual freedom, the members of this sect conceived themselves released not only from the rules of the church, but also from the obligations of morality. They set aside the marriage-tie, and indulged in licentiousness. A few even maintained that the deeds of the body could not possibly affect the soul. Intellectually, they are said to have been Pantheistic. The synods of Cologne, 1306, and of Treves, 1310, decreed their suppression, and in the persecutions which ensued, they appear to have been completely dispersed.

The Brethren of Social Life, Brethren of the Common Lot, or Brethren of Good Will (also called Hieronymites and Gregorians, from Hieronymus and Gregory the Great, whom they claimed as patrons): a fraternity founded about 1376 by Geert Groote (1340–84; b. Deventer, and Florentius Radewin (1350–1400; b. Leerdam, s. Holland). This society—which professed to be a copy of the earliest Christian communities, and was in several respects a forerunner of the subsequent societies of United Brethren, now sometimes styled Moravians—was composed of persons who sought after pious and spiritual exercises without any conventional distinctions of order, etc. Community of goods, ascetic habits, industry, care of the education of young persons, and the use of the vernacular language in divine service, were some of the chief points insisted on by the brethren, who were not fettered by monastic or other vows. Perfect community of goods was a rule of their societies. Despite the persecutions which they suffered from the mendicant friars, they were recognized and sanctioned by several popes and by the Council of Constance. They became most numerous in the Netherlands, and n. Germany, but spread also in Italy, Sicily, and Portugal, so that, 1430, they reckoned more than 130 societies. The last was founded at Cambray, 1505. Several brotherhoods of Gregorians assisted in the Reformation. In other cases, their institutions fell into the hands of the Jesuits. Though the founders of these societies were opposed to all learning and science which was not purely moral and practical, their followers rendered most important services to popular education, having free schools in connection with many of their houses, supporting students at other schools, and distributing useful books. They have, indeed, been correctly described as pioneers of the Reformation. After the revival of learning in Italy, the Brethren of Social Life entered into the spiritual activity of the time. The most important and distinguished members of the

society were Gerhard Zerbold of Zütphen, Thomas-à-Kempis, and the learned Cardinal Nicholas Cusa.—Societies of women, of similar character, sprang up at the same time with those of the Brethren of Social Life. At the head of each was a superior or directress, styled the *Martha.*

BROTHERHOOD OF ANDREW AND PHILIP: a religious order founded in 1888, and which has spread among the churches of 19 denominations and is represented in a large proportion of the states. Its official organ is *The Brotherhood Star.* The pledge of service is similar to that of the Brotherhood of Saint Andrew (q.v.). The name of the society contains an allusion to the fact that Andrew, the first of the 12 disciples to become a follower of Christ, immediately after entering upon his discipleship sought out his brother Philip and brought him to the Master.

BROTHERHOOD OF SAINT ANDREW: a religious organization of the Protestant Episcopal Church, founded in 1883 in St. James' Parish, Chicago. It has more than 1,200 active chapters, exclusive of the junior department. The society has extended to Canada, England, Scotland, Australia, the West Indies, and South America. The official organ of the brotherhood is *St. Andrew's Cross,* published monthly. There are two rules, one of prayer and one of service. The pledge of service binds every member to make an earnest effort to bring at least one young man each week within the hearing of the gospel.

BROTHERHOOD OF SAINT PAUL: a fraternity of the Methodist Episcopal Church, founded in 1895, for the spiritual and social benefit of its members. Of the three orders into which it is divided—the Order of Jerusalem, the Order of Damascus, and the Order of Rome—the first is for new members and those who are not professing Christians; the second for members of the Methodist Episcopal Church, and the third for advanced Christians. The brotherhood has a ritual and a regalia.

BROTHER JONATHAN: term for a typical American; a familiar personification of the United States people; probably derived from Gov. Jonathan Trumbull (q.v.) of Connecticut.

BROTHERS: group of six or eight rocky islets immediately outside the Strait of Bab-el-Mandeb, varying in height from 250 to 350 ft. They lie off the African coast about 9 m. s. of the island Perim, now occupied by England. Of the loftiest point, the lat. and long. respectively are 12° 28′ n., and 43° 22′ e.

BROTHERS is also the name given to three isolated mountains near the coast of New South Wales, between Harrington Inlet to the s,, and Port Macquarie to the

n., or between lat. 32° and 31½°s. They are valuable as landmarks.

BROTHERS, LAY: inferior class of monks, not in holy orders, but bound by monastic rules, and employed as servants in monasteries (q.v.).

BROTHERS OF THE CHRISTIAN SCHOOLS: commonly called Christian Brothers. This is a society of men belonging to the Roman Catholic Church who devote themselves exclusively to the education of youth. The society was founded in 1680 by Jean Baptiste de la Salle, canon of the Metropolitan Church of Rheims, who, in the year 1900, was canonized by Pope Leo XIII.

The society spread rapidly in France, partly because the Brothers made French the language of the schools instead of Latin, and partly because they did away with the individual system of teaching by grouping the pupils together into distinct classes. They abandoned the lecturing style in all their instructions for the Socratic method, introduced object-lessons and added museums to the equipment of the school.

These bold innovations in education met with popular favor and official recognition, and did more than anything else to bring about a general system of primary instruction in France. In consequence of these reforms in the traditional methods of teaching, the Christian Brothers have come to be considered the founders of primary education in Europe. In due time, the society spread to Italy, Belgium, Germany, Austria, England, and Ireland; and also to Canada, the United States, South America, India, and South Africa.

The general methods of teaching followed by the Brothers, are explained in the *Government of the Christian Schools,* while the qualities which they should possess as teachers are expounded in the *Twelve Virtues of a Good Master.* Besides these two manuals, the society has published for the benefit of its members numerous works on education and pedagogy together with a series of text-books on all subjects taught in the schools, including logic, ethics, literature, philosophy, methodology, mathematics, physics, etc.

The Christian Brothers established a college for the training of teachers in 1684, which was the first of its kind in Europe. They opened Sunday schools in 1699, also the first of their kind, in which secular as well as religious instruction was given in the afternoon. They have novitiates in every 'province' of the Society for the religious formation, and scholasticates for the pedagogical training of their members. They direct schools of all grades from the primary to the college; they have agricultural and technical schools as well as Normal Colleges, orphanages and 'protectories.' In the United States, they have 6 colleges and 90 other institutions taught by 980 Brothers. Altogether, the

Society had in 1904, 1,570 schools, with 15,500 Brothers and 321,000 pupils.

The Society was suppressed in 1792 at the beginning of the French Revolution, was restored in 1803 by order of Napoleon I., and incorporated with the University of France in 1808. It was again officially suppressed in France in 1904 during the war against religious congregations waged by Premier Combes, but continued to live and flourish in other countries.

BROTHERS OF THE SACRED HEART: a Roman Catholic congregation established in Lyons, France, in 1820 by Père André Coindre, of the Society of Missionaries. In 1847 five Brothers came from France to this country to take charge of parish schools and asylums. They have establishments in the diocese of New Orleans, Natchez, Mobile, Natchitoches, Savannah, Trenton, Indianapolis, Manchester, Providence, Boston, Indian Territory and over 30 places in Canada. In 1900 September at a general Chapter of the congregation held in France, two provinces were formed, one for the United States and the other for Canada. The object of the Brothers is the Christian education of youth in schools, asylums and colleges. A novitiate for the province of the United States was opened in Metuchen, N. J., 1901, June.

BROTHERS OF OUR LADY OF LOURDES: this congregation was founded by Very Rev. S. M. Gloriux in 1830. Its object is the Christian education of youth, especially the poor, the care of orphan asylums, and the nursing of the sick and old people in hospitals. Pope Leo XIII. approved the congregation and its rule 1892, July 18. The Brothers conduct a House of Studies and a boarding and day school at South Park, Wash., and a protectory for Homeless Boys, at Pittsburg and New Derry, Pa.

BROTHERS OF CHARITY: a congregation founded for the purpose of securing the sanctification of its members by the practice of the three simple vows and the observance of its constitution. Its special object is the ministry of charity in maintaining and ministering to the aged, the sick and the insane, in sheltering the poor, in educating poor children and performing any other work of charity to which they may be called. The congregation was founded in Belgium about 1809 by Rev. I. Triest, canon of Saint Bavon, Ghent.

BROTHERS OF THE CHRISTIAN INSTRUCTION: a Roman Catholic Institute founded at Saint Brieuc, France, by the Abbé John Mary De la Mennais, and approved by the Holy See in 1891. The Order was established in Canada in 1886 and has 12 establishments in the archdiocese of Montreal; one in the archdiocese of Ottawa, one in the diocese of Saint Hyacinth, two in the diocese of Three Rivers, and one in the diocese of Valleyfield. The object of the Order is the

Christian education and instruction of youth. General motherhouse at Ploermel, France; Provincial House and Novitiate at Laprairie, near Montreal.

BROTHERS AND CLERKS OF THE COMMON LIFE: an institute founded by Gerhard Groot, a deacon of Deventer in 1384 for the purpose of providing a home for men who desired to live an austere Christian life without taking perpetual vows.

BROTHERTON, Alice (Williams): American author and lecturer; b. Cambridge, Ind. She married William Ernst Brotherton, 1876, Oct. 18. She has lectures on Shakespeare and other subjects in English literature, contributed to magazines, and published the volumes: *Beyond the Veil* (1886); *The Sailing of King Olaf* (1887); and *What the Wind Told the Tree-tops* (1888).

BROUGHAM, n. *brô'ăm* [after Lord *Brougham*]: a light four-wheeled close carriage.

BROUGHAM, *brô'am or brô'm*, Henry, Lord Brougham and Vaux: 1778, Sep. 19—1868, May 7; b. Edinburgh. His father, Henry B. was the descendant of an ancient family in Westmoreland, and his mother, Eleonora Syme, a woman of much talent, was a niece of Robertson the historian. Brougham received his education at the High School, and afterward at the Univ. of Edinburgh. He gave early promise of ability, some mathematical papers written by him at the age of 18 having been considered worthy of publication in the Transactions of the Royal Soc. He spent some time in travelling on the continent, and in 1800 was admitted to the Scotch bar. In company with Jeffrey, Horner, and Sydney Smith, Brougham's first public efforts were in the service of the *Edinburgh Review*, and he contributed to it some of its most powerful articles. His liberal political views excluded him from the hope of promotion in Scotland, and a character which he had acquired for eccentricity and indiscretion, excluded him from all legal practice, except the unremunerative practice of the criminal courts. After seven years of vain attendance in the courts of Edinburgh, he betook himself to a field more worthy of his ambition, and in 1808 passed at the English bar.

In London, Brougham first attracted public notice by his admirable appearance at the bar of the house of commons, when he was employed on behalf of certain Liverpool merchants to ask the repeal of the Orders in Council. Soon after this, in 1810, he entered parliament, and within a few months of the time of taking his seat, brought in and carried his first public measure —an act making participation in the slave-trade felony. He was welcomed by the opposition leaders, to whose party he had attached himself, as a most powerful assistant in their attacks upon the government. Brougham succeeded in carrying the repeal of the obnoxious Orders

in Council shortly before the general election of 1812, and then ventured to contest, with another whig, the membership for Liverpool against Canning and another tory. He was defeated, and remained without a seat in parliament till 1816, when he was returned for Winchelsea, and again became an active member of the opposition. By this time he had also established some reputation in the courts of law. He never, indeed, acquired a very large practice, but he repeatedly distinguished himself by speeches of great vigor and ability in the defense of persons prosecuted for libel by the crown. His most famous appearance as an advocate, however, was in defense of Queen Caroline, when, with Denman, he defended the injured queen with unequalled courage and disinterestedness, at the cost, as both well knew, of exclusion, for years to come, from all professional advancement. But his eloquence and boldness, though they forfeited for him the favor of the crown, gained him that of the people, and for the ten years 1820–30, Brougham was the popular idol. He made no bad use of his power. In 1822, he used it, though in vain, in support of a scheme of national education; and to his activity is owing, in great measure, the establishment of the London Univ., of the first Mechanics' Institute, and of the Soc. for the Diffusion of Useful Knowledge. In 1830, Brougham delivered a most powerful speech against slavery, and in consequence of it—as he himself believes—was invited to stand, and returned, as member for the great popular constituency of the county of York. The aristocratically disposed whigs would—had they dared—have excluded Brougham from the reform ministry; but, in addition to having enormous popularity, he was virtually their leader in debate in the commons, and was thus, in spite of his unmanageableness, indispensable. After various intrigues, Brougham was offered, and was persuaded, against both his interests and his inclinations, to accept a peerage and the chancellorship. He took his seat in the lords 1830, Nov., and assisted materially in carrying through that house the great measures proposed by the liberal ministers. He shared in the general popularity, which afterward attached to those ministers, and when they were dismissed by William IV. 1834, Brougham left office, never to return to it. After that time, he held in the upper house a position as nearly analogous as may be to that formerly held by him in the commons, criticising freely the conduct of successive administrations, and steadily forwarding every measure for social progress.

It will be as a law-reformer that Brougham will be best remembered. He took up Romilly's uncompleted task, of carrying into practice the ameliorations suggested by Bentham. His efforts in this direction began as early as 1816, when he introduced into parliament a bill to remove various defects in the law of libel. In 1827, in a memorable speech which occupied six hours

in delivery, Brougham enumerated the defects in nearly every branch of English law, and made proposals for dealing with law-reform on a proper scale. These, as might have been expected, met small encouragement. It has been the fortune of many of his measures to be carried afterward, in a mutilated form, by other hands. After he left office, Brougham succeeded in carrying various reforms in the law, among which were extensive changes in the law of evidence. Among the measures proposed by Brougham, but left for future law-reformers to carry, were bills for the codification of the criminal law, for the establishment in England of a system of public prosecutors, and for the giving of compensation to parties acquitted. Lord Brougham's acts and bills, as well those regarding the slave-trade, education, and other public questions, as those touching on law-reform, have been collected and published by Sir J. E. Eardley Wilmot (Lond., Longman, 1857). The large well-filled volume which they form is the most fitting monument that could be preserved of the activity, perseverance, and public spirit of the man.

As an orator, more especially as a debater in parliament, Brougham was, among the men of his time, inferior only to Canning. He was wont, however, to indulge in his speeches in too large an admixture of exciting elements; argument was mingled with fiery declamation; ridicule, sarcasm, invective, were freely used; and these he dealt out with a vehemence and energy that at times carried him far beyond bounds. The power of ready, rapid, and forcible diction was eminently his. In many other fields besides oratory, Brougham won a high reputation. He cultivated mathematical and physical science with success, and ventured upon the domain of metaphysics, and even of theology. His miscellaneous writings are of great extent, and upon an almost incredible variety of subjects. They were, however, intended more to serve purposes of the moment, than as permanent additions to literature; and though they show great powers of rapid comprehension and nervous, clear exposition, it cannot be said that they set forth any new truths in politics or morals, or any original discoveries in science. The honors due to men of letters Brougham did not fail to acquire, having successively been made lord rector of Glasgow Univ., pres. of Univ. College, London, member of the Institute of France, chancellor of the Univ. of Edinburgh and lastly, D.C.L. of Oxford.

Lord Brougham took a warm interest in legal and social reform. While not engaged in parliament, he resided chiefly at Cannes, in the s. of France, where he died. His lordship married, 1819, Mary Anne Eden, granddaughter of a baronet in the county of Durham. The issue of this marriage was two daughters, who died before reaching womanhood. The patent of the title to the peerage was extended to make it descend to the

family of his brother. Brougham left a Memoir of his Life and Times, published in three vols. (1871).

BROUGHAM, JOHN, actor: 1810–80; b. Ireland; son of a brilliant amateur painter. He was educated at Dublin Univ., where he became a classical scholar. Quitting the study of surveying on account of poverty, he went to London to enter the East India Service. Having histrionic talent, which had been cultivated at Dublin, and meeting a theatrical friend, he changed his plans, accepted the loan of a guinea, and acted in *Tom and Jerry* at the Prince of Wales' Theatre. His first hit was made as O'Slash in the *Invincibles*, a part which in its name is typical of his individual line of dramatic art. This year, 1830, or the year following, he wrote his first play, a burlesque prepared for William E. Burton, then acting in London. In 1831 he went with Mrs. Vestris to the Olympic Theatre, and appeared in the cast of *Olympic Revels*, in the first full bill that she issued there. In 1840 he was director of the Lyceum, for which theatre he wrote a number of plays. He came to New York 1842, and appeared in the Old Park Theatre. Soon afterward he joined the Burton company in Chambers street, where he made many brilliant hits both as actor and as manager. Here he also wrote a number of plays, among which were *Vanity Fair*, *All is Fair in Love*, *Dombey and Son*, and the *Irish Emigrant*. Afterward he managed Niblo's Garden; in 1850, Dec., he opened Broome's Lyceum, on Broadway; then was a member of Wallack's company till 1856; and afterward managed the Bowery Theatre, reviving *King John* with splendid scenery. Meanwhile he was writing more plays, among which were the *Game of Love*, *Bleak House*, *A Decided Case*, *Game of Life*, *Playing with Fire*, *Pocahontas*, *Love and Murder*, *Romance and Reality*, etc. In 1860 he returned to England, where he remained five years, playing, writing and adapting plays, among them *The Duke's Motto*. He acted at the Princess' in his own comedy of *Playing with Fire*. Brougham reappeared in the United States 1865, and soon after his return joined Wallack's company, with which he remained until his death. Among his later plays are *John Garth* and *The Lily of France*.

Brougham was twice married, first to Emma Williams, a beauty of the Juno type, who obtained a divorce; then to Annette Nelson, a singing actress, and at one time manager of the Richmond Hill Theatre.

BROUGHT, v. *brawt:* pt. pp. of BRING, which see.

BROUGHTON, JOHN CAM HOBHOUSE, Lord: 1776–1869; English statesman. He was educated at Cambridge, where he was intimate with the poet Byron, with whom, later, he made a tour of s. Europe. As a radical in politics he, 1816, wrote a book on the *Hundred Days in Paris*. The work gave much offense both in England and on the continent, and so bitter was the

feeling in Paris that the printer and translator there was sentenced to fine and imprisonment for 'atrocious libel.' The author himself was imprisoned in Newgate nearly three months. Two years later, however, he was elected to parliament as a martyr to toryism. For the next twelve years he was an ardent advocate of the liberal measures which have made that time famous, such as the repeal of the Test and Corporation Acts, and the Rom. Cath. Emancipation Act. In 1831 he was sec. of war in the Gray ministry, and the same year became a baronet. He was subsequently commissioner of woods and forests, and pres. of the board of control. On becoming a peer, 1851, he ceased to participate in public affairs.

BROUGHTY-FERRY, *braw'tē-fĕr'rĭ:* town of Forfarshire, Scot., on the Firth of Tay, 4 m. e. of Dundee. It is connected with Ferry-Port-on-Craig, in Fifeshire, by a railway-ferry over the firth, here a mile broad, which before the opening of the Tay bridge, formed the chief connection between Edinburgh and Fife with Dundee. It has cod and other white fisheries. Many Dundee merchants occupy fine villas at B.-F. On the shore stands an ancient castle, lately repaired as a defense for the Tay. Pop. of B. 7,644.

BROUSSA, *brô'sâ,* or BOUR'SA: ancient *Prusa,* where the kings of Bithynia usually resided; lat. 27° n., long. 40° e.; at the foot of Mount Olympus, in Asia Minor. Prusa is said to have been built by Prusias, King of Bithynia, who waged war with Crœsus or Cyrus Seifeddulat, of the race of Hamadan, took it in 336 of the Hegira, but it was retaken by the Greek emperor, A.D. 947. In 1356, Orcan, son of Othman, second emperor of Turkey, captured it, and made it the cap. of his empire, and it continued so until the taking of Constantinople by Mohammed II., 1453.

Broussa is most pleasantly situated, facing a beautiful and luxuriant plain, covered for many miles with plantations of mulberry-trees. The city and suburbs are about six m. in circumference. The town is divided from the e. suburb by a deep channel or vale, over which there are several bridges, one of them—with shops on each side—being 90 paces long and 16 broad. The streets are remarkably clean, and the bazaars very good, being supplied with European goods from Constantinople. It contains a great number of mosques, some of which are fine buildings. The silks of B. are much esteemed in the European markets, and great quantities are exported every year to France, Constantinople, and Smyrna. The inhabitants manufacture a kind of silk, like satin, mostly striped, used for the undergarment of the oriental dress; also a material from silk and flax, used chiefly for shirts; and a sort of gauze, called 'brunjuke' much worn by the Turkish ladies for under-garments. A great quantity of British

manufactured goods, such as Manchester 'twists,' 'gray calicoes,' 'prints,' 'zebras,' etc., are imported into B., the goods being landed at Constantinople, and thence conveyed overland to Broussa. It is the official residence of a Turkish pasha, and the seat of a Turkish tribunal. B. is subject to frequent earthquakes. In ancient times, it was famous for its thermal baths, or 'royal waters,' as they were called, which still remain. Pop. 35,700, of which abt. 5,000 Armenian.

BROUSSAIS, *brô-sā'*, François Joseph Victor: 1772, Dec. 17—1838, Nov. 17; b. St. Malo, France: founder of the 'Physiological School.' In early life, after studying at Dinon, he served for a time first in the navy, then in the army. In 1820, he was appointed first proc. at the military hospital of Val-de-Grace. In 1832, he became prof. of general pathology and therapeutics in the Faculty of Medicine in Paris, and afterward was made a member of the Institute. He died at his country residence at Vitry. In 1841, a statue was erected to his memory in the court of Val-de-Grace. Broussais' peculiar views are ably explained in his chief works—the *Histoire des Phlegmasies ou Inflammations Chroniques* (1808), and *Examen de la Doctrine Médicale généralement adoptée* (1816), which assert the following principles: that life is sustained only by excitation; tnat this excitation may be either too strong (*surexcitation*) or too weak (*adynamie*), the latter case, however, being far less frequent than the former. These abnormal conditions of surexcitation and adynamie at first manifest themselves in a specific organ of the body; but afterward, by sympathy, are extended to other organs; that is, all diseases are originally *local*, and become *general* only by sympathy of the several organs. The organs most subject to disease are the stomach and the bowels, and therefore *gastro-enteritis* (inflammation of the stomach and the intestines) is the basis of pathology; consequently, Broussais resorted to local phlebotomy—especially the application of numerous leeches to the region of the abdomen—as a remedy in fevers and various diseases. His theory and practice gained many adherents in France, who took the name of the 'Physiological School.' But a more exact knowledge of physiology has demonstrated that the views of Broussais were one-sided and exaggerated. Yet they have not been without use in pathology, as they have led to a more careful study of pathological anatomy and physiological sympathies, and to a more exact observation of the so-called specific morbid processes of which the existence was denied by Broussais and his followers. Montègre, *Notice Historique sur la Vie, les Travaux, et les Opinions de Broussais.*

BROUSSONET, Pierre Marie Auguste: French naturalist; b. Montpellier, 1761, Feb. 28; d. there, 1807, July 27. In Paris he studied natural history; went to England

and pursued ichthyology, and after three years' residence there returned and was assistant in the College of France. At this period he communicated a number of valuable papers to the Academy of Sciences, of which he became a member. In 1785 he was appointed secretary to the Paris Agricultural Society. Merino sheep and the Angora goat are said to have been first introduced by him into France. The Revolution breaking out, he became connected with the Girondists. On the downfall of that party he was arrested at Montpellier, but having escaped, crossed the Pyrennes under the pretext of botanizing, and arrived in Spain destitute. Later he went to Africa and resumed his botanical studies, making some important collections. Returning to France, after executing various missions he was appointed in 1805, to the chair of botany at Montpellier. In the same year he became a member of the Corps Législatif. He died from the effects of a fall by which the brain had been seriously injured. Besides his *Ichthyologiæ Decas Prima* (1872), his publications include important memoirs of ichthyology and botany.

BROUSSONETIA: a genus of trees. See MULBERRY.

BROUWER, ADRIAN: see BRAUWER, ADRIAN.

BROW, n. *brow* [AS. *braew;* Russ. *brov,* brow: *Dut. brauwe,* an eyelid, margin: Icel. *bra,* eyelid; *brun,* an eyebrow]: the ridge over the eye; the forehead; the edge or brink of a steep place, as of a river or hill: V. to form an edge or brink to. EYEBROW, n. *ī'brow,* the hair over the eye. TO KNIT THE BROWS, to frown; to scowl. BROWBEAT, v. *brow'bēt,* to daunt or depress by haughty and stern looks; to bully into submission by arrogant and impudent language. BROW'BEATING, imp.: N. the act of discouraging or depressing by stern and rough language. BROWBEATEN, pp. *brow-bēt'n.* BROWBOUND, having the head crowned or encircled, as with an ivy wreath.

BROWER, *brow'er,* DANIEL ROBERTS: American physician; b. Philadelphia, Pa., 1839. In 1864 he was appointed assistant surgeon of the United States volunteers and has since been medical superintendent of the Eastern Lunatic Hospital of Virginia, 1868–75, and professor of nervous diseases in the Rush Medical College of Chicago, and in the Woman's Medical College of the Northwest University at Evanston, Ill. He has published a *Manual of Insanity.*

BROWER, JACOB VRADENBURG: American explorer and archæologist; b. York, Mich., 1844, Jan. 21; d. 1905. He served in the cavalry and the navy during the Civil War, was a member of the Minnesota legislature, 1867–73, and discovered numerous prehistoric mounds at Mille Lac and other points in Minnesota. He published *The Mississippi River and Its Source* (1893);

Prehistoric Man at the Head Waters of the Mississippi (1895); *The Missouri River and Its Utmost Source* (1896); *Quivira* (1898); *Harahey* (1899); *Mille Lao* (1899).

BROWN, a. *brown* [Ger. *braun;* Icel. *brunn;* F. *Brun;* It. *Bruno,* perhaps the color of things burnt—from Goth. *brinnan,* to burn]: of a dark or dusky color, inclining to redness: V. to make dusky or dark. BROWN'ING, imp. BROWNED, pp. *brownd.* BROWN'ISH, a. somewhat brown. BROWN'NESS, n. the quality of being brown. BROWN-COAL, n. lignite or wood-coal of a brown color, being coal imperfectly mineralized and presenting a decidedly woody structure. BROWN-STUDY, n. gloomy or dull thoughtfulness or reverie; properly, a species of reverie in which the attention has the consent of the will to give full play to whatever train of ideas may be uppermost. BROWN'ING, n. liquid burnt sugar, etc., used for coloring gravy, etc.; the act or operation of giving a brown color to. BROWNY, a. *brown'ĭ,* having the color of brown. TO BE DONE BROWN, to be roasted well; to be deceived or cheated. BROWN-BESS, n. *-bĕs* [Low Ger. *büsse,* a blunderbuss: Dut. *bus,* a gun-barrel]: the familiar name for the old flint-lock muskets, which had their barrels browned to keep them from rusting. BROWN BREAD, bread of a dark color, as opposed to white bread; bread baked of flour containing the whole produce of the wheat.

BROWN, AARON VENABLE: American politician; b. Brunswick co., Va., 1795, Aug. 15; d. 1859. He studied law, and commenced practice in Nashville, Tenn. He was partner in busiess with President Polk, until the latter entered upon his congressional career; served in almost all the sessions of the legislature of Tennessee between 1821 and 1832; was a member of the house of representatives in congress from 1839 to 1845; and was in that year elected governor of Tennessee. He was a delegate to the southern convention held at Nashville in 1850, and submitted a report to that body known as the Tennessee platform. He was also a member of the convention of the democratic party at Baltimore in 1852, to which he reported the platform adopted by them. In 1857 he became a member of President Buchanan's cabinet, in which he held the office of postmaster-general.

BROWN, ABBIE FARWELL: American writer for young people; b. Boston, about 1875. She has published *The Book of Saints and Friendly Beasts* (1900); *In Days of Giants* (1902); *The Lonesomest Doll* (1901); *A Pocket Full of Posies* (1902) verse; *Library for Young People* (1903); *The Curious Book of Birds* (1903); *The Flower Princess* (1904); *The Star Jewels and Other Wonders* (1905).

BROWN, ABRAM ENGLISH: American historical writer; b. Bedford, Mass., 1849, Jan. 21. He is the

author of *Beneath Old Roof Trees* (1896); *Beside Old Hearthstones* (1897); *History of Bedford* (1892); *Glimpses of New England* (1894); *Flag of the Minute Men* (1894); *Faneuil Hall and Market; John Hancock.*

BROWN, ALEXANDER: American historian; b. Glenmore, Nelson co., Va., 1843, Sept. 5; d. 1906, Aug. 26. He served in the Confederate army during the Civil War and after 1880 devoted himself to literary pursuits. He wrote *New Views of Early Virginia History* (1886); *The Genesis of the United States* (1890); *The Cabells and Their Kin* (1895); *The First Republic in America* (1898); *The History of Our Earliest History* (1898); *English Politics in Early Virginia* (1901).

BROWN, ALICE: American novelist and writer of short stories descriptive of phases of New England life; b. Hampton Falls, N. H., 1857, Dec. 5. She taught school for several years, but has given herself entirely to literary pursuits for some years. Her work is most careful and conscientious in character, displaying equal literary skill and sympathetic insight into character. She has published: *Fools of Nature; Meadow Grass* (1895); *By Oak and Thorn,* a volume of English travels (1896); *The Road to Castaly,* a work of verse (1896); *The Day of His Youth* (1896); *Tiverton Tales* (1899); *King's End; Margaret Warrener; Mercy Otis Warren,* a biography; *The Mannerings; High Noon,* etc.

BROWN, BENJAMIN GRATZ: 1826–85; b. Lexington, Ky.: lawyer and politician. He graduated at Yale, 1847, and settled in St. Louis. In 1854, he began to edit *The Missouri Democrat,* in which he boldly assailed the institution of slavery during five years, suffering much personal abuse, and once wounded by a pistol ball. He was a prominent leader among the unionists of Missouri 1861, served in the U. S. senate 1863–67, and in 1871, was elected liberal republican gov. of Missouri. In 1872, he was liberal republican and democratic candidate for vice-pres., Horace Greeley heading the ticket.

BROWN, CAROLINE VIRGINIA (KROUT): American novelist: b. Crawfordsville, Ind. She is a sister of Mary H. Krout, and has always lived in her native town. She has published *Knights in Fustian* (1900); *Bold Robin and His Forest Rangers* (1905); *On the We-A Trail* (1905); etc.

BROWN, CHARLES BROCKDEN: 1771, Jan. 17—1810; b. Philadelphia: novelist. He studied for the law, but by the imaginative tendency of his mind he was soon led into literature. The French revolution exercised considerable influence on his thoughts and sentiments. In 1798, he published *Wieland,* the first of his remarkable fictions; and, 1799, *Ormond, or the Secret Witness.* His next production was *Arthur Mervyn, or Memoirs of*

the Year 1793—the fatal year of yellow fever in Philadelphia. In 1801 appeared *Edgar Huntly, or the Adventures of a Sleepwalker,* a romance of wild and picturesque adventure. This was followed in the same year by *Clara Howard,* and in 1804 by *Jane Talbot,* first printed in England. B. also composed a number of political pamphlets and contributed to various literary magazines. In 1799, April, Brown published the first number of the *Monthly Magazine and American Review.* This work he continued until the end of the year 1800, writing abundantly for it. Circumstances compelled him to relinquish it; but in 1805 he commenced another journal, with the title of the *Literary Magazine and American Register,* and in this undertaking persevered for five years. In 1806 he entered upon a new work, a semi-annual *American Register,* five volumes of which he lived to complete and publish. It is now and must long be consulted as a valuable body of annals. B. shows fine invention of incident and subtle analysis of feeling, but tends to lose hold on reality.

BROWN, Charles Rufus: American clergyman and Hebrew scholar; b. East Kingston, N. H., 1849, Feb. 22. He was graduated at the United States Naval Academy in 1869, at Harvard in 1877, and at Union Theological Seminary in 1879. He was ordained a Baptist minister in 1881 and held pastorates at Salem and Worcester, Mass. He has been professor of Hebrew at Newton Theological Institution since 1886, and has written important text-books in the Oriental languages. He has also published *An Aramaic Method* (1884–93).

BROWN, Elmer Ellsworth: American educator; b. Kiantone, N. Y., 1861, Aug. 28. He was graduated from the Illinois State Normal University 1881; from the University of Michigan in 1889 and studied in German universities from 1889–90. He was principal of public schools in Belvidere, Ill., 1881–4; ass't state secretary Y. M. C. A. of Illinois, 1884–7; principal high school, Jackson. Mich., 1890–1; acting ass't professor of science and art of teaching, University of Michigan, 1891–2; associate professor in the University of California, 1892–3, and full professor 1893–8; professor of theory and practice of education at same, 1898–1906; and since 1906 has been United States Commissioner of Education. He is the author of *Democracy in the Universities* (1891); *The Making of Our Middle Schools* (1903); *Origin of American State Universities* (1905); and the monographs *Notes on Children's Drawings* in University of California *Studies* (1897); and *Secondary Education,* the fourth of a series on education in the United States prepared for the Paris Exposition 1900.

BROWN, Emma Elizabeth: American author and artist; b. Concord, N. H., 1847, Oct. 18. She was educated in the Concord common schools. She has written lives of Washington, Grant, Garfield, Holmes, and Low-

ell; *From Night to Light, Child Toilers,* and much verse, besides contributing illustrated papers to leading magazines.

BROWN, Ernest William: American mathematician; b. Hull, England, 1866, Nov. 29. He was educated at Christ's College, Cambridge, England, and has been a professor of mathematics at Haverford College, Pa., since 1891. He is a Fellow of the Royal Society of England, and the author of a noteworthy *Treatise on the Lunar Theory.*

BROWN, Ford Madox: English painter, grandson of Dr. John Brown of Edinburgh, the author of the Brunonian system of medicine; b. Calais, France, 1821, April 16; d. London, 1893, Oct. 6. He studied at Brugés, Ghent, and Antwerp, and after a three years' residence in Paris he went to England about 1845. In 1844 and 1845 he contributed (unsuccessfully) cartoons of the *Finding of the Body of Harold, Justice,* and other subjects to the competitive exhibition for the frescoes of the Houses of Parliament. In 1865 he opened in London an exhibition of many of his pictures, including *The Last of England* (1852); *The Autumn Afternoon;* and *Work* (1865); the last named having occupied him for several years. Only a month before his death he completed the last of the 12 Manchester town-hall frescoes, on which he had been engaged for a long time. Among his other works are *Lear and Cordelia* (1849); *Pretty Baa-Lambs* (1851); *Chaucer at the Court of Edward III.* (1851); and *Cordelia's Portion.* He is generally rated as a pre-Raphaelite, but though a close intimacy existed between him and the brotherhood, he never actually joined them. See Hueffer, *Ford Madox Brown; a Record of His Life and Work* (1896).

BROWN, Francis, American scholar: b. Hanover, N. H., 1849, Dec. 26. He was graduated from Dartmouth College in 1870, and the Union Theological Seminary, New York, in 1877. He was instructor in biblical philology in the latter institution 1879–81, and associate professor of the same 1881–90. Since the year last named he has been professor of Hebrew and cognate languages there. He is the author of *Assyriology: Its Use and Abuse in Old Testament Study* (1885); *The Teaching of the Twelve Apostles* with Hitchcock; *Hebrew and an English Lexicon of the Old Testament* with Driver and Briggs (1891–1901); *The Christian Point of View,* with Knox and McGiffert (1902).

BROWN, Sir George: 1790–1865; b. Linkwood, near Elgin, Scotland: British general. He entered the army 1806, became lieut. 1807; served in the Peninsular war. At the battle of Talavera he was severely wounded, and at the storming of Badajoz was one of the forlorn-hope. He was appointed major, 1814, May 26; lieut. col., Sep. 29. In 1814, he was in maj. gen. Ross's expedition against the United States, and was wounded at the

battle of Bladensburg. From 1824, Feb. 6—1842, he commanded a battalion of the Rifle Brigade. He was made adj.gen. of the forces, 1850, Apr., and lieut.gen., 1851. In the Crimean war, 1854–5, B. commanded the Light Division. At the battle of Inkermann, 1854, Nov. 5, he was severely wounded, and obliged to retire for a short time to Malta. In 1855 he was created a Knight Commander of the Bath. In the expedition to the Sea of Azof, he commanded the British troops; and in the first unsuccessful attack on the Redan of Sebastopol, he had the chief command of the storming-party. He was gazetted 1856, Apr. 3, 'General in the army for distinguished service in the field.' He was a Knight of Hanover, received the Turkish order of the Medjidie of first class, 1855; and the grand cross of the Legion of Honor, 1856. In 1860 he became commander-in-chief in Ireland, and in 1862 a privy-councilor.

BROWN, George, Canadian statesman: b. Edinburgh, Scotland, 1818, Nov. 19; d. 1880, May 9; educated at the high school there. He emigrated to the United States with his father and assisted in the management of a newspaper at New York; but in 1843 removed to Toronto, Canada, where he founded a newspaper, *The Globe*, which was very successful. In 1852 he was returned to Parliament, and rapidly rose to the first rank as a debater and advocate of reforms. In 1858 he was called to the office of premier, and formed an administration which, however, owing to an adverse vote of the Assembly, lasted only three days. In 1864 he joined the coalition government as leader of the reform section, and took an active part in the conferences held at Charlottetown and Quebec on the subject of the federation of the North American colonies; but resigned his office as minister in December 1865. He was called to the Senate in 1873, and the year after went to Washington along with Sir Edward Thornton to negotiate a commercial treaty with the United States. He died of a gunshot wound inflicted by a discharged employee. See Mackenzie, *Life and Speeches of the Hon. George Brown* (1882).

BROWN, George, American rear-admiral: b. Indiana, 1835, June 19. He entered the navy in 1849 and served with distinction in the Federal navy during the Civil War. He was in command of the Norfolk navy yard, 1866–97, being appointed a rear-admiral in 1893. He was retired 1897, June 19.

BROWN, George Douglas: Scottish novelist; b. Ochiltree, Ayrshire, Scotland, 1869; d. London, 1902, Aug. 28. He was educated at the universities of Glasgow and Oxford and was successively reported for a London journal and literary adviser to a publishing house. His novel of Scottish life, *The House with the Green Shutters*, published in 1902, attracted great attention in England and the United States. See *Life* (1903).

BROWN, George Loring, American landscape artist: b. Boston, 1814, Feb. 2; d. 1889, June 25. He went abroad at 16 and on his return, two years later, was a pupil of Washington Allston. In 1840 he went to Paris to study under Isabey. Among noted pictures by him are *Doge's Palace and Grand Canal; Bay of Naples; Moonlight Scene; The Crown of New England;* and *The Bay of New York,* the two latter acquired by Edward VII. when visiting the United States as Prince of Wales.

BROWN, George William, American jurist: b. Baltimore, Md., 1812; d. 1890. After studying law he was admitted to the bar and in 1860 was elected mayor of his native city. At the time of the passage of troops through Baltimore, 1861, April 19, he placed himself at the head of the 6th Massachusetts regiment then on its way to Washington, and did everything in his power to suppress the riot which the appearance of the soldiers had occasioned. He was chief justice of the Maryland supreme court, 1873–88, and with two others compiled the first *Digest of the Decisions of the Maryland Court of Appeals* (1847).

BROWN, Glenn, American architect: b. Fauquier County, Va., 1854, Sept. 13. He has practised his profession in Washington, D. C., since 1878. He is the author of *Water Closets; a Historical, Mechanical and Sanitary Treatise* (1884); *Healthy Foundations for Houses* (1885); *Trap Syphonage* (1886); *History of the United States Capitol* (1900); etc.

BROWN, Goold: 1791–1857; b. R. I.; descended from some of the early Quaker settlers of New England. At 19 years of age he taught a district school in his native state; then a Friends' boarding school in Dutchess co., N. Y., 1811. In 1813 he removed to New York where for more than 21 years he conducted an academy. Finding that the grammars in use at that time were inadequate, he set about providing better ones. The superiority of B.'s methods soon became apparent, and his books commanded a large sale. His most important work is *A Grammar of English Grammars.* At the time of his death, in Mass., he had just finished a revision of this.

BROWN, Harvey, American army officer: b. Rahway, N. J., 1795; d. Clifton, Staten Island, 1874, March 31. He graduated at West Point in 1818 and was in constant service, for more than 45 years. In the Black Hawk expedition, the Seminole Indian campaigns, in the Army of Occupation in Mexico, and to the time of the Civil War, he did gallant duty, for which he received several brevets. In 1862 he was brevetted a brigadier-general in the regular army and promoted colonel, and in 1863 was promoted to major-general, and retired.

BROWN, Helen Dawes, American novelist and lecturer upon English literature; b. Concord, Mass., 1857.

She has published *Two College Girls* (1886); *The Petrie Estate* (1893); *Little Miss Phœbe Gay* (1895); *Phœbe Gay in Her Sixteenth Year; A Civilian Attache; A Book of Little Boys* (1904); etc.

BROWN, Henry Billings, American jurist: b. Lee, Mass., 1836, March 2. After studying law in the Yale and Harvard law schools he went to Detroit and was there admitted to the bar in 1860. In 1875 he was appointed United States district judge for eastern Michigan, retaining this post till 1890, when he became an associate justice of the supreme court of the United States. He has compiled a much valued volume of admiralty reports.

BROWN, Henry Kirke, American sculptor: b. Leyden, Mass., 1814, Feb. 24; d. Newburg, N. Y., 1886, July 10. He made the equestrian statue of Washington in Union Square, New York, the altar piece for the Church of the Annunciation in the same city, portrait busts of William Cullen Bryant, Dr. Willard Parker, Erastus Corning and other New York men, and the statue of De Witt Clinton in Greenwood cemetery. The last named was the first bronze statue cast in the United States. Mr. Brown brought skilled workmen from Europe and did the first work in bronze casting attempted in this country. Some of his other well-known works are a statue of Lincoln in Prospect Park, Brooklyn, and equestrian statues of Gen. Scott and Nathanael Greene for the national government.

BROWN, J. Appleton, American artist: b. Newburyport, Mass.; 1844, July 24; d. 1902. He studied art in Boston and Paris, and after having a studio in Boston for some years removed to New York in 1890 and became a member of the Society of American Artists. Noted works by him are *Old Road Near Paris; On the Merrimac at Newburyport; The Grain Field* (1902).

BROWN, Jacob: 1775–1828; b. Bucks co., Penn.; soldier. He became a surveyor, and 1796–98 surveyed public lands in Ohio. Then he settled in N. Y., taught school, studied law, and wrote political articles for the press. Later he bought land in Jefferson co., where he erected the first house in Brownsville, now a prosperous village. He became county judge and col. of militia. His military promotion to the rank of gen. was rapid; and in the war of 1812 he commanded our troops on the Canadian frontier, where he showed skill and courage in the defense of Sackett's Harbor, and in the battles of Chippewa and Niagara. In acknowledgment of his services the city of New York granted him its freedom, and congress gave him a vote of thanks, together with a gold medal, emblematical of his triumphs. In 1821, Mar. 10, he became gen.-in-chief of the U. S. army.

BROWN, James Baldwin, D.D.: 1820–84; b. Inner Temple, London; eldest son of the Rev. Dr. James

Baldwin B. After studying at Univ. College, London, he studied law; but later prepared for the Congl. ministry. In 1843, he began preaching at Derby; in 1846, took charge of Clayhand's Independent Chapel, London; and removed with his congregation to a new church in Brixton Road 1870. He was chairman of the Congl. Union of England and Wales, 1878. Among his many publications are: *The Christian Policy of Life* (1869); and *The Higher Life, etc.* (1874).

BROWN, John, of Haddington: 1722–1787, June 19; b. Carpow, near Abernethy, Perthshire: formerly the most popular, still among the most revered theological writers in Scotland. Deprived of both his parents when only 11 years of age, he became assistant to a venerable and pious shepherd, John Ogilvie, who nursed the boy's religious sentiments. Romantic yet well accredited stories, related by his biographers, illustrate his insatiable thirst for learning. While still a friendless 'herd laddie,' with no teacher, he had made great progress in Greek and Latin; so that the country-people round about believed that he was in league with the devil, and had pledged his soul for unhallowed lore. At a later period of his life 'he knew nine or ten languages, classical, oriental, and modern, and had amassed vast stores of Puritan, Scottish, and Dutch divinity.' After a brief career as a pedlar—an employment which Wordsworth's *Excursion* may show was neither mean nor degrading—Brown became a volunteer in the regiment of militia raised in Fifeshire during the rebellion of 1745; and in 1747, schoolmaster in the neighborhood of Kinross. During the vacations of his school he studied philosophy and divinity under the inspection of the associate synod, and the superintendence of the Rev. Ebenezer Erskine and James Fisher. In 1750 he was ordained pastor of the secession church at Haddington. Perhaps a more faithful, industrious, and holy minister never labored in Scotland. David Hume was once prevailed upon to go and hear him, and the criticism of the great skeptic was: 'That old man preaches as if Christ were at his elbow.' Although self-educated, he had little of the narrowness which usually accompanies culture so obtained; he corresponded on friendly terms with Episcopalians, and often expressed a warm affection for all true Christians. Although himself a sound Presbyterian Calvinist, 'the love of the Lord' was his real and ultimate test of a man's orthodoxy. In 1758, Brown published *Help for the Ignorant;* and in 1765, his famous *Christian Journal.* In 1768, he was appointed prof. of divinity under the associate synod, and in the same year issued his valuable *Dictionary of the Holy Bible.* In 1771, appeared his *History of the Church from the Birth of the Savior;* and 1778, the *Self-interpreting Bible.* This last, Brown's *magnum opus,* has been amazingly popular in Scotland,

and has been commended by high dignitaries of the Anglican church. Brown also issued a great variety of sermons, tracts, etc.

BROWN, JOHN, D.D.: 1784, July 12—1858, Oct. 13; son of John Brown, minister of Whitburn, and grandson of John Brown, of Haddington. He studied at Edinburgh Univ., and at the theological hall of the Secession Church. In 1806 he was ordained to the pastorate of a church in Biggar; a small town in Lanarkshire. In 1822, he was transferred to Rose Street Church, Edinburgh, and 1829 to Broughton Place Church, in the same city. In 1834, he was appointed prof. of pastoral and exegetical theology in connection with the associate synod. Dr. Brown was a powerful and exceedingly attractive preacher, and an expositor of Scripture. Among his works are: *The Law of Christ respecting Civil Obedience; The Resurrection of Life;* and his scholarly *Expository Discourses on the Epistles of Peter, on the Epistle to the Galatians, and on the Epistle to the Romans.*

BROWN, JOHN, M.D., LL.D.: author of *Rab and his Friends:* 1810, Sep. 22—1882, May 11; b. Biggar, Lanarkshire; son of John Brown, D.D., and great-grandson of John Brown, of Haddington. He studied medicine at Edinburgh Univ., and in 1832 established himself at Edinburgh as a physician, in which profession he was highly esteemed; but it was as an essayist of rare insight, quaint fancy, humor, and tenderness, that he became well known to all English-speaking people. He contributed to various magazines, and in 1858 issued a first volume of collected essays, to which he gave the name of *Horæ Subsecivæ.* In 1882 the *Horæ* were extended and rearranged in three volumes, of which the first comprises *Locke, Sydenham,* and other papers. *Rab and his Friends,* a powerful but eminently simple tale of a Scottish carrier and his dog Rab, gives name to the second volume. This story, delightfully combining smiles and tears, pathos and humor, soon attained world-wide popularity, and has been frequently reprinted and translated. The third series of the *Horæ* is *John Leach and other papers.* Brown was catholic, kindly, loving and beloved. He was a Fellow of the Royal Soc. of Edinburgh, and had a civil-list pension of £100 allotted to him 1876.

BROWN, JOHN, M. D.: 1735–88; b. in Bunkle parish, Berwickshire, Scotland: son of a day-laborer, and himself first intended for a weaver. He was educated at the grammar-school of Dunse, in which he was subsequently an usher. After studying medicine at the Edinburgh Univ., he became tutor to the children of the celebrated Dr. Cullen, and assistant in his university lectures. Conceiving himself slighted by Cullen, he commenced giving lectures upon a new system of medicine, according to which all diseases are divided into the

sthenic, or those depending on an excess of excitement, and the asthenic, those resulting from a deficiency of it; the former to be removed by debilitating medicines, as opium, and the latter by stimulants, such as wine and brandy. His system (known as the Brunonian system) gave rise to much opposition, but his partisans were numerous; for a time his opinions had some influence. In 1779 Brown took the degree of M.D. at the Univ. of St. Andrews, and in 1780 published his *Elementa Medicinæ*. He was also author of *Observations on the Old System of Physic*. In 1786, overwhelmed with debt, he removed to London, where he died of apoplexy. His works, with a memoir by his son, Dr. William Cullen Brown, appeared 1804 (3 vols. 8vo).

BROWN, JOHN, American merchant: b. Providence, R. I., 1736, Jan. 27; d. there, 1803, Sept. 20. A man of energy and enterprise, he developed the industry and extended the trade of his native city in a notable degree, being, it is said, the first merchant in Rhode Island to carry trade to China and the East Indies. Though having large interests at stake in the existing order of things, he was a leader in the cause of the American Revolution, and headed the party which destroyed the Gaspée in Narragansett Bay, 1772, June 17. He was chosen a delegate to the Continental Congress in 1784, but did not take his seat in that body. When Rhode Island refused to adopt the national Constitution, he did more than any other man toward securing the final reversal of that opposition. From 1799 to 1802 he was a representative in Congress. He at all times fostered the interests of the Baptist Church, contributed largely to the endowment of the present Brown University, laid the cornerstone of its original hall, and was its treasurer from 1775 to 1796.

BROWN, JOHN, American soldier: b. Sandisfield, Mass., 1744, Oct. 19; d. Stone Arabia, N. Y., 1780, Oct. 19. He graduated at Yale 1771, studied law in Providence, R. I., and in 1773 settled in Pittsfield, Mass., where he identified himself actively with the patriot cause. In 1775 he was a delegate to the provincial Congress, and was with Ethan Allen at the capture of Ticonderoga. In the same year he assisted in the capture of Fort Chambly, planned the attack on Montreal which resulted disastrously, and was at the storming of Quebec. Congress commissioned him a lieutenant-colonel in 1776, and in 1777 he conducted an expedition against Ticonderoga and the posts in its vicinity, releasing one hundred American prisoners and capturing large quantities of stores and provisions. Soon after this he retired from the service on account of his detestation of Arnold. At Albany in the winter of 1776–7 he published a handbill denouncing Arnold, predicting that he would become a traitor, and closing with the remarkably prophetic words, 'Money is this

man's God, and to get enough of it he would sacrifice his country.' Brown was afterward employed in the Massachusetts service, and in the autumn of 1780, with the Berkshire militia, marched up the Mohawk valley for the relief of Schuyler and to act as circumstances might require. He was killed in ambush with 45 of his men at Stone Arabia, in Palatine, on his birthday.

BROWN, Captain JOHN: anti-slavery enthusiast: 1800, May 9—1859, Dec. 2; b. Torrington, Conn. Peter Brown, his paternal ancestor in the sixth generation, was one of the company who came over in the *Mayflower;* Peter's grandson, a captain in the revolutionary army, married a girl of Welsh descent; and his son, Owen Brown, married a woman of Dutch descent; so that John Brown had in his veins blood of three distinct nationalities. Until the age of 20 he assisted his father, a farmer and leather-dresser; he afterward learned the profession of a surveyor. He was twice married, and became the father of 20 children, of whom 12 lived to maturity. As early as 1834, Brown was a resident of Randolph, Penn., where he was postmaster. Already he had become imbued with those anti-slavery sentiments which became the leading characteristic of his after life. To his brother he wrote that it was his purpose to make active war upon slavery, his plan being to bring together 'some first-class abolition families' and undertake the education of colored youth; adding that 'if once the Christians of the free states would set to work in earnest teaching the blacks, the people of the slave-holding states would find themselves constitutionally driven to set about the work of emancipation immediately. Through several years it is not possible to follow minutely Brown's career. About 1836 he removed with his family to Ohio; and thence in 1846 to Mass., occupied mostly as a wool-dealer. At this time Gerrit Smith offered to give 100,000 acres of wild land in northern New York, to suitable colored families who would settle there. Brown received a small farm in the township of North Elba, whither he removed with his wife and younger children, leaving the elder sons in Ohio. In 1854, the five elder sons went to Kansas, and took up land claims some eight miles from the settlement of Ossawatomie, where they were soon joined by their father.

Quarrels soon broke out between the pro-slavery and the anti-slavery settlers in Kansas. Bloody outrages ensued. An incident in the spring of 1856 shows the spirit of the contest. Five anti-slavery settlers had been deliberately put to death by their opponents. By way of retaliation as many pro-slavery men were called out of their dwellings and one by one shot down by a party of men, prominent among whom were Brown and his sons. Brown was naturally a captain; his activity, boldness, and pertinacity were shown in his remarkable defense of Ossawatomie against greatly superior numbers.

Early in the summer of 1859, Brown's plans for an active war upon slavery had taken definite form. His sympathizers at the east had put him in possession of a considerable supply of arms, and a few hundred dollars in money. Thus provided, he appeared in the neighborhood of Harper's Ferry, Va., where he hired a small, secluded farm. One by one his adherents made their way thither, until there were twenty-two besides himself. On the evening of 1859, Oct. 2, Brown gave the word to commence operations by marching on the Ferry. Six of the party were sent to seize some of the neighboring planters, who were to be detained as hostages. Brown, with the others, moved upon the Ferry. Before midnight the gates of the U. S. Armory had been forced open, the few guards overpowered or over-awed, and the streets of the town were patrolled by Brown's men. An alarm was raised; the people began to arm themselves; and shots were interchanged by which several persons were killed. During the next day Col. Robert E. Lee came up from Washington with a company of U. S. marines. Brown and the six survivors of his party took refuge in the engine-house of the armory, where they were picked off one by one, two of the slain being Brown's sons; and he was severely wounded and made prisoner. He was brought to trial before a Virginia court. He had every possible advantage of counsel, furnished by his friends in Massachusetts. But nothing could save him. The facts in the case were too patent for denial. He was sentenced to be hung 1859, Dec. 2, at which date the sentence was duly executed. Four of his associates were tried at the same time, and two others not long afterward; all of whom were hung. The life of John Brown has been written by James Redpath, by Richard D. Webb, and more recently by Frank D. Sanborn. This last biography is pronounced by Mr. Thomas W. Higginson to be 'the result of much personal research, and to be a mine of information in regard to one of the most remarkable men of his time.'

BROWN, John George, Anglo-American painter: b. Durham, England, 1831, Nov. 11. He was educated in the common schools in Newcastle-on-Tyne, and came to the United States in 1853. He studied in the schools of the National Academy of Design; was elected an academician in 1863; received honorable mention at the Paris Exposition in 1899; and from 1887–1904 was president of the American Water Color Society. He is best known for his pictures of bootblacks and street urchins. Among his famous pictures are: *A Merry Air with a Sad Heart; The Stump Speech; The Passing Show; Be Mine;* and *Training the Dogs; A Thrilling Moment; Heels over Head; To Decide the Question; Three for Five Cents;* etc.

BROWN, John Hamilton, American inventor: b.

Liberty, Maine, 1837, July 28. At the age of 18 he was apprenticed to a gunsmith and in 1857 entered business in Haverhill, Mass. He served in the Civil War as a sharpshooter, and in 1882 was a member of the American Rifle Team at Wimbledon. He began in 1883 to perfect the invention of a weapon for military use later known as the Brown segmental wire-wound gun, which, after numerous government tests, was pronounced a success.

BROWN, JOHN HOWARD, American editor: b. Rhinebeck, N. Y., 1840, Nov. 8. After studying law in New York and engaging in journalism in Washington. D. C., and Augusta, Ga., he became a publisher in New York. In 1896 he removed to Boston to become editor-in-chief of *Lamb's Biographical Dictionary of the United States* (7 vols., 1879–1902). He is the author of *American Naval Heroes* (1899), and of numerous contributions to periodical literature. He has also edited *National Cyclopedia of American Biography* (6 vols., 1890–5); *Notable Americans* (10 vols., 1903); *Men of Mark in Massachusetts* (6 vols., 1905–6); etc.

BROWN, JOHN LEWIS, French artist: b. Bordeaux, 1829, Aug. 16; d. 1892. He studied under Belloc and Roqueplan and was famous as an impressionist painter of military and hunting scenes, as well as of studies of horses and dogs. Among his numerous works are: *Steeple Chase* (1861); *At the Outposts* (1865); *Relay of Omnibus Horses* (1884); *Hohenlinden* (1887).

BROWN, JOHN NEWTON, American Baptist clergyman: b. New London, Conn., 1803, June 29; d. 1868. He studied at what is now Colgate University, Hamilton, N. Y., and filled successive pastorates at Buffalo, N. Y.; Providence, R. I.; Malden, Mass.; and Exeter, N. H. While at Exeter he commenced his literary labors by editing the *Encyclopædia of Religious Knowledge* (1835). In 1838 he became a professor of exegetical theology and ecclesiastical history in the New Hampton theological institution, N. H., where he remained till 1845. He edited *The Christian Chronicle and National Baptist* (1849–68), and was the author of *The New Hampshire Confession* (1852).

BROWN, JOHN W., American author: b. Schenectady, N. Y., 1814, Aug. 21; d. Malta, 1849, April 9. He graduated at Union College in 1832, and was settled as an Episcopal minister at Astoria, N. Y. In 1845 he became editor of the *Protestant Churchman.* He was the author of the *Christmas Bells, a Tale of Holy Tide, and Other Poems,* and of several prose tales of a religious character.

BROWN, JOHN YOUNG, American lawyer: b. Claysville, Hardin County, Ky., 1835, June 28; d. Henderson, Ky., 1904, Jan. 11. He graduated at Center College, Danville, 1855, studied law, and was admitted to the

bar. In 1859 he was elected to Congress, but not having attained the constitutional age, could not take his seat. He was again elected to Congress in 1868, but his seat was refused him by the House because of political disabilities. Finally he served in Congress (1873–7). He retired to the practice of law and during 1891–5 he was Democratic governor of Kentucky.

BROWN, Joseph Emerson, American statesman: b. Pickens County, S. C., 1821, April 15; d. Atlanta, Ga., 1894, Nov. 30. He was educated at Calhoun Academy, and graduated at Yale in 1846. He settled in Canton, Ga.; served in the State legislature, and was elected governor in 1857; serving three terms. As war governor he opposed Jefferson Davis in the matter of the conscription laws and raised 10,000 recruits to oppose Sherman's march to the sea; but would not allow them to leave the State. After the war he gave hearty support to the reconstruction measures, and supported Gen. Grant for the presidency. He was Chief-Justice of Georgia in 1868, and United States Senator in 1880–91.

BROWN, Lancelot, English landscape gardener, sometimes called 'Capability Brown': b. at Kirkharle, 1715; d. 1773. He commenced life as a kitchen gardener, but, by his industry and genius, rose rapidly in public estimation till he came to be regarded as a kind of oracle in taste in regard to all rural improvements, agricultural, horticultural, and even architectural. His extensive employment enabled him to realize a handsome independence, and he adorned the station to which he had worked his way with more graces and virtues than are often displayed by those who have been born to it. He obtained the dignity of high sheriff of Huntingdon in 1770. He avoided the stiff formality of the older landscape gardens, but is charged with having often sinned against good taste by endeavoring to reform natural scenery, and force it, under all circumstances, to assume the form of clumps, belts, and serpentine canals. His architectural performances are remarkable for their interiors.

BROWN, Moses, American naval officer: b. Salisbury, Mass., 1742; d. at sea 1804. He was a sailor in early life, and commanded the United States privateer *General Arnold*. He was the first commander of the sloop of war *Merrimac*, having the rank of captain U. S. N. He was retired by Thomas Jefferson and reentered the merchant service.

BROWN, Nicholas, American merchant and philanthropist: b. Providence, R. I., 1769, April 4; d. there, 1841, Oct. 27. He graduated at Brown University, 1786. Through the death of his father in 1791, he inherited a handsome fortune, formed a partnership with his brother-in-law, Thomas P. Ives, and became one of the most successful and best-known merchants of America. In 1792 he gave $500 to Brown University

with which to purchase law books. This was the beginning of a long series of endowments and benefactions to that institution, which took its present name in honor of him in 1804, when he endowed a professorship of oratory and *belles-lettres.* In 1822 he built Hope College, at an expense of $20,000; Manning Hall in 1834, at a cost of $18,500; and a president's house in 1840, costing $7,000. The total of his various gifts amounted to $160,000. He was a trustee from 1791 to 1825;; a fellow, 1825–41, and treasurer from 1796 to 1825. He was also a generous donor to the Providence Athenæum and Butler Hospital for the Insane. He served several terms in the State legislature, and in 1840 was a presidential elector.

BROWN, Oliver Madox, English artist, son of Ford Madox Brown (q.v.): b. 1855; d. 1874. From early boyhood he showed remarkable capacity both in painting and literature, especially prose fiction and poetry. His two most promising pictures were *The Tempest—Prospero and the Infant Miranda* (exhibited in 1871 at the International Exhibition, South Kensington), and *A Scene from Silas Marner* (1872). *Gabriel Denver* (1873), and some other unfinished novels, besides sonnets and other poems, show wonderful literary power in one so young. His *Literary Remains* were published in 1876.

BROWN, Robert: 1549–1630; son of Anthony Brown, of Folthorp, Rutlandshire. He was an English clergyman, founder of the sect of Brownists. Brown was educated at Cambridge, and was at first a preacher at Bennet Church, then a schoolmaster in Southwark, and a lecturer at Islington. In 1580 he began to attack the order and discipline of the established church, and soon formed a distinct church on democratic principles at Norwich. Committed by Dr. Freake, bishop of that see, to the custody of the sheriff, he was released from prison through the influence of the lord-treasurer, Cecil, to whom he was nearly related. Having, 1582, published a controversial work, entitled *The Life and Manners of True Christians,* with, prefixed, *A Treatise of Reformation without Tarrying for Any,* he was again arrested, but, through the lord-treasurer's intercession, again liberated. He afterward formed several independent churches; but, with many of his followers, was driven to take refuge in Holland. In 1589, he returned to England, reconciled himself to the Established Church, and became rector of a church near Oundle, Northamptonshire. Of a very violent temper, he was, when 80 years old, sent to Northampton jail, for an assault on a constable, and died in prison. The Brownists continued, notwithstanding the defection of their leader, to subsist as a separate sect for some time both in Holland (among the English there) and in England. In Holland, they were at last absorbed in, or reconciled

to, the Presb. Church in 1701; in England they may be said to have given birth to the Independents (q.v.), later known as Congregationalists (q.v.), who rose into great importance in the 17th c.

BROWN, ROBERT: botanist: 1773, Dec. 21—1858, June 10; b. Montrose, Scotland; son of an Episcopal clergyman. He was educated at Marischal College, Aberdeen; studied medicine at the Univ. of Edinburgh; and became, 1795, ensign and assist. surgeon in a Scottish fencible regt., with which he went to Ireland. Applying himself to botany, he resigned his commissions, 1800, and the following year was engaged as naturalist in the expedition for the survey of the Australian coasts. On his return 1805, he brought home nearly 4,000 species of Australian plants, a large proportion new to science. Soon afterward he was appointed librarian to the Linnæan Soc. To the *Transactions* of the Edinburgh Wernerian Soc., and those of the Linnæan Soc., he contributed memoirs on *Asclepiadeæ and Proteaceæ*, and published *Prodromus Floræ Novæ Hollandiæ et Insulæ Van Diemen's*, vol. i. 1810; a supplement appeared 1830, relating to the *Proteaceæ* only. He also wrote the *General Remarks, Geographical and Systematical, on the Botany of Terra Australis*, attached to the narrative of Captain Flinder's expedition, 1814. His adoption of the natural system of Jussieu, the French botanist, led to its general substitution in place of the Linnæan method. Brown's numerous memoirs in Transactions of societies, and other contributions to botanical science, secured for him from Alexander von Humboldt the title *Botanicorum facile Princeps*. In 1810, Brown received the charge of the library and splendid collections of Sir Joseph Banks, which in 1827 were transferred to the British Museum, when he was appointed keeper of the botanical dept. In 1811, he was elected F.R.S.; in 1832, was made D.C.L. of Oxford; and 1833 was elected one of the 18 foreign associates of the Acad. of Sciences of the Institute of France. In 1839, the Royal Soc. awarded him their Copely medal for his *Discoveries during a Series of Years on the Subject of Vegetable Impregnation*. He was pres. of the Linnæan Soc., 1849–53. He died in London. A collected edition of Brown's works, 5 vols. 8vo, has been published in Germany.

BROWN, SAMUEL, M.D.: 1817, Feb. 23—1856, Sept. 20; son of Samuel Brown, and grandson of John Brown, of Haddington. He entered the Univ. of Edinburgh, 1832. He took his degree as M.D. in 1839, and immediately surrendered himself to chemical study. One idea possessed him through life—the possibility of reconstructing the whole science of atomics. He never, in spite of crushing failures in experiment, abandoned his early conviction that chemical elements, usually considered simple, might be transmuted into each other.

In 1843, he delivered in Edinburgh four critical lectures on the atomic theory. During the same year he became a candidate for the chair of chemistry in the univ. of that city; but having perilled his claims on the experimental success of his fatal theory, and being again doomed to disappointment, he withdrew his application, and devoted himself with a kind of mournful austerity, and with more than the earnestness of a mediæval alchemist, to the solitary work of his laboratory. In 1850 appeared his *Tragedy of Galileo*, a volume which indicates, but does not embody, the finely imaginative and philosophical genius of its author. His fugitive essays, collected and published after his death, show the qualities which drew the admiration of Hamilton, Ferrier, De Quincey, Wilson, Carlyle, Hare, Jeffrey, and Chalmers.

BROWN, Samuel R.: 1810–80: b. Conn.: missionary. He graduated at Yale College 1832, and went as missionary to China 1838. He founded at Canton the Morrison Chinese School and presided over it till his return to the United States 1847. This was the first Protestant school in China. In 1859 he went as missionary to Japan and established himself at Yokohama, where likewise he was a pioneer in Christian missions. He translated the Bible into the Japanese language, and published many articles on Japanese and Chinese subjects. He published also, *Colloquial Japanese; Prendergast's Mastery System Applied to English and Japanese;* and translated various Japanese books into English.

BROWN, Thomas, m.d.: Scottish metaphysician: 1778–1820: b. at the manse of Kirkmabreck, Kirkcudbrightshire; son of the Rev. Samuel Brown. After being some time at school in England, he went to Edinburgh 1792, and for several years attended the lectures of Playfair, Black, Robison, and Dugald Stewart. He began the study of law, but shortly abandoned it for medicine; and having taken his diploma of m.d. 1803, he became (1806) partner of Dr. Gregory in a large practice. But his strong bent was for literature and philosophical speculation. At the age of 18, he had published a refutation of Darwin's *Zoonomia;* was a member of an Acad. of Physics, or society for 'the investigation of the laws of nature,' formed 1797, including Erskine, Brougham, Leyden, Jeffrey, Smith, and others; and contributed at the outset to the *Edinburgh Review.* In 1804 appeared his essay on *Cause and Effect,* in which he holds that there is nothing in a cause but the fact of immediate and invariable antecedence to the change called its effect. Dugald Stewart, professor of moral philosophy in the univ., being obliged, from bad health, to retire in 1810, secured the appointment of Dr. Brown, as assistant and successor, which office he held till his death. He was popular as a professor; and his *Lectures,* published after his death, went

through a great many editions, though in recent years they have largely fallen out of notice. He also wrote much poetry, now forgotten. Dr. Brown attempted to overturn the psychological system of his predecessors Reid and Stewart, and to substitute a new and simplified scheme of mental phenomena. The greater part of this new philosophy was the production of his first session as professor, the writing of each lecture being begun on the evening previous to its delivery. A philosophic system thus improvised could not but be crude and inconsistent, however acute and imaginative its author might be. B. first brought into prominence the part played by *muscular sensations* in the perception of space. He also emphasized in a valuable way the part played by meaning and significance in the association of ideas.

BROWN, Thomas Edward, English poet: b. Isle of Man, 1830; d. Clifton, England, 1897, Oct. 20. After a brilliant career at Christ Church College, Oxford, he became assistant master at Clifton College, Bristol, in 1862, resigning in 1892. His work, though strong and remarkably original, failed to attract general attention during his lifetime, but when collected in 1900, contemporaneously with two volumes of his *Letters*, they drew forth extended notices from leading critical reviews and journals in England and the United States. His poems, which are written in Anglo-Manx dialect for the most part, are chiefly narrative, and include *Betsy Lee* (1873); *Fo'c's'le Yarns, including Betsy Lee* (1881); *The Doctor and Other Poems* (1887); *The Manx Witch and Other Poems* (1889) *Old John and Other Poems* (1893).

BROWN, William: 1784–1864; b. Ballymena, Ireland: founder of the free public library at Liverpool: educated at Catterick, near Richmond, Yorkshire; in his 16th year accompanied his parents to the United States. Employed in the counting-house of his father, in the linen trade in Baltimore, in a few years he was admitted a partner. Returning to England 1809, he established a branch of the business at Liverpool, and laid the foundation of one of the largest mercantile firms in the world. Embarking in the American trade, he became an extensive importer of cotton, and by his energy and integrity soon became distinguished for the magnitude of his dealings. A liberal reformer, he took a prominent part in local and public affairs, and unceasingly promoted the education of the people. In 1844, he contested South Lancashire upon the anti-corn-law league interest without success, but was returned to parliament for that division of the county 1846, and was three times re-elected. A series of letters in defense of free trade, which, 1850, he contributed to the *Pennsylvanian* (Boston newspaper), attracted much attention.

BROWN, William Garrott, American writer: b. Marion, Ala., 1868, April 24. He graduated at Harvard in 1891, taking highest honors in history, and became assistant in the Harvard Library. In 1892 he took an active part in the Presidential campaign, serving on various committees and stumping Massachusetts in behalf of Cleveland. He has made a special study of Southern history, and since 1900 has devoted himself to writing and lecturing on this topic, contributing chiefly to the *Atlantic Monthly*. His writings in book form are: *Andrew Jackson* (1900); *History of Alabama* (1901); *The Lower South in American History* (1902); *Stephen A. Douglas* (1902); *Golf* (1902); *History of the United States Since the Civil War* (1903); *A Gentleman of the South* (1903); *A Foe of Compromise and Other Essays* (1903); etc.

BROWN, William Montgomery, American Protestant Episcopal bishop; b. Orrville, Ohio, 1855, Nov. 6. He entered the Episcopal ministry, became archdeacon of Ohio in 1891, and in 1898 was consecrated coadjutor bishop of Arkansas, becoming bishop of that diocese in 1900, Sept. 5.

BROWN-SEQUARD, Charles Edouard, *shârl â-dd-âr brown-sā-kâr*, Franco-American physiologist and physician: b. Mauritius, 1818; d. Paris, 1894, April 1. His father was a sea captain from Philadelphia, who married on the island a lady named Séquard. The son studied in Paris and graduated M.D. in 1846. He devoted himself mainly to physiological research, and received numerous prizes, French and British, for the results of valuable experiments on blood, muscular irritability, animal heat, the spinal cord, and the nervous system. In 1864 he became professor of physiology at Harvard, but in 1869 returned to Paris as professor of pathology in the School of Medicine. In 1873 he became a medical practitioner in New York, treating especially diseases of the nervous system; and in 1878 succeeded Claude Bernard as professor of experimental medicine at the Collège de France. He repeatedly lectured in England. His publications include lectures on *Physiology and Pathology of the Nervous System* (1860); on *Paralysis of the Lower Extremities* (1860); and on *Nervous Affections* (1873).

BROWN COAL: mineral substance of vegetable origin, like common coal, but differing in its more distinctly fibrous or woody formation, which is sometimes so perfect that the original structure of the wood can be discerned by the microscope, while its external form also is frequently preserved. In this state it is often called *Wood coal;* and it sometimes occurs so little mineralized that it may be used for the purposes of wood, as at Vitry, on the banks of the Seine, where the wood-work of a house has been made of it. From this to the most perfectly mineralized state, it occurs in all different

stages. It is often brown or brownish-black, more rarely gray. It burns without swelling or running, with a weaker flame than coal; emits in burning a smell like that of peat, and leaves an ash more resembling that of wood than of coal. Wherever it occurs in sufficient abundance it is used for fuel, though very inferior to common coal. *Bovey coal*, so called from Bovey Tracey, in Devonshire, where extensive beds of it occur, and where it has been long wrought, is brown coal, and often exhibits the woody structure. Brown Coal occurs in a number of other places in Britain, and more abundantly near Paris, and in Liguria and Hanover, where it forms thick beds in alluvial deposits.—The *Surturbrand* (q.v.) of Iceland is regarded as a variety of it. *Jet* (q.v.) is also sometimes regarded as a variety of brown coal. Although bearing the name coal, Brown Coal is rather a kind of *lignite* (q.v.) than of coal.

BROWNE, Charles Farrar: 1836–1867, Mar. 6; b. Waterford, Me.: humorist, known as 'Artemus Ward.' He graduated from the free village school into a printing-office. As a printer's boy he worked in many principal towns in New England, until settled at Boston, where he began to write comic stories and essays. A roving disposition led him to the west, and he was engaged as local editor in Toledo, O., and later in Cleveland, where his letters from 'Artemus Ward, showman,' a pretended exhibitor of wax figures and wild beasts, first attracted general attention. In 1860, he became a contributor to *Vanity Fair*, a New York comic weekly paper, and being invited to lecture soon became very popular. As a lecturer 1863, he visited California, making the overland trip, visiting Salt Lake City, and drawing crowds in every town. In 1864, he opened his illustrated lectures on California and Utah in New York with immense success; and in 1866 was induced to visit England, where he became a contributor to *Punch*, and gave his lecture on the Mormons in the metropolis, at the Egyptian Hall, Piccadilly. But while convulsing crowded audiences with laughter, he was wasting with pulmonary disease. Early in 1867, he went to Guernsey for a milder air, but with no benefit; and was about to embark for America, when he died at Southampton. He was tall, slender, with striking features, and a most amiable character, which attracted and attached to him many friends. By his will, after providing for his mother, leaving legacies to his friends, and his library to the best boy in the school of his native village, he left the bulk of his property in trust to Horace Greeley to provide an asylum for printers. His collected writings, which have had wide circulation in America and England, are *Artemus Ward, His Book; Artemus Ward among the Mormons; Artemus Ward*

among the Fenians; and a posthumous collection and biography entitled *Artemus Ward in England.*

BROWNE, Charles Francis, American artist: b. Natick, Mass., 1859, May 21. He studied at the Boston Art Museum, the Philadelphia Academy of Fine Arts, and the Paris Ecole des Beaux Arts. He has been for some years lecturer and instructor in the history of art in the Chicago Art Institute, and has exhibited both in this country and Europe.

BROWNE, Edward Granville, English Orientalist: b. Uley, England, 1862, Feb. 7. He was educated at Eton and Pembroke College, Cambridge. He traveled in Persia (1887–8), was lecturer in Persian at Cambridge 1888–1902 and since 1902 Sir Thomas Adams professor of Arabic. He has published *A Traveler's Narrative, Written to Illustrate the Episode of the Báb,* Persian text and English translation with notes (1891); *The New History of Mirzá and Ali Muhammad the Báb* (1893); *A Year Amongst the Persians* (1893); etc.

BROWNE, Edward Harold, English prelate: b. Aylesbury, Buckinghampshire, 1811, March 6; d. Winchester, Hampshire, 1891, Dec. 19. He was educated at Emmanuel College, Cambridge, took orders in the Anglican Church in 1836, and was consecrated Bishop of Ely in 1864. In 1873, he was transferred to Winchester, resigning this bishopric in 1891. He was a prominent advocate of the old Catholic movement in Germany and one of the Old Testament company of revision of the King James version of the Bible. He published *An Exposition of the XXXIX. Articles* (1850–3); *Sermons on the Atonement and Other Subjects* (1859); *The Messiah Foretold and Expected* (1862); *The Pentateuch and the Elohistic Psalms in Reply to Bishop Colenso* (1863); *The Stripe, the Victory, and the Kingdom* (1872); *Position and Parties of the English Church* (1875); *Commentary on Genesis in the Speaker's Commentary.*

BROWNE, Frances, Irish poet: b. Stranorlar, Donegal, Ireland, 1818, June 16. When she was 18 months old she lost her sight from small-pox. From her brothers and sisters attending the village school she obtained as much information as they were acquiring, and listened to such books as they would read to her. *Robinson Crusoe* and *Mungo Park's African Adventures* were among these works. The prose writings of Sir Walter Scott, with which she became familiar from their being read to her, deeply influenced her mind. In 1841 she commenced contributing verse to the *Athenæum,* edited at that time by Mr. T. K. Hervey. He became interested in her story, related it with considerable effect in the *Athenæum,* paid her for her writings, and introduced her to other publications, from which she also derived pecuniary benefits. In 1844 the *Star of Atteghei* and other poems appeared in a small

volume, which was well received. Among the advantages accruing to the poet from it, was her being placed on the pension list for £20 a year by Sir Robert Peel, prime minister.

BROWNE, Francis Fisher, American editor and author: b. South Halifax, Vt., 1843, Dec. 1. During the Civil War he served in the 46th Massachusetts Volunteers. He edited the *Lakeside Monthly*, 1869–74, and in 1880 became editor of *The Dial*, Chicago, which under his direction has come to be one of the two or three American literary journals worthy of being ranked with the best English periodicals of similar scope. Publications: *Every-day Life of Abraham Lincoln* (1886); *Volunteer Grain* (1896), poems. He has edited *Golden Poems by British and American Authors* (1881); *Golden Treasury of Poetry and Prose* (1883); *Bugle Echoes: a Collection of Poems of the Civil War* (1886); etc.

BROWNE, George Forrest, English bishop: b. York, England, 1833. H was educated at St. Catharine's College, Cambridge, and ordained 1858. He was appointed theological tutor and bell lecturer in ecclesiastical history in the Episcopal Church of Scotland, 1862; fellow and lecturer at St. Catharine's, 1863–5; secretary and chief organizer of the Cambridge local examinations. He was rector of Ashley, 1869–75; Disney professor of archæology, 1887–92; canon of St. Paul's, 1891–7; bishop of Stepney, 1895–7, whence he was transferred to the see of Bristol. He is the author of *Ice Caves of France and Switzerland* (1865); *The Venerable Bede* (1879); *University Sermons* (1878–80); *The Ilam Crosses* (1889); *Early English Church History* (1893); *The Church at Home Before Augustine* (1894); *Augustine and His Companions* (1895); *Conversion of the Heptarchy* (1896); *Theodore and Wilfrid* (1897); *History of St. Catharine's College* (1902); *Life and Works of St. Aldhelm*, and various publications of the Church History Society (1894–7).

BROWNE, George Waldo, American author: b. Deerfield, N. H., 1851, Oct. 8. For five years he edited *American Young Folks*, and is a well-known writer for young people. He has written over 100 serials and several hundred short stories and articles for the leading juvenile periodicals. Of his books the best known are: *The Woodranger* (1899); *Two American Boys in Hawaii* (1899); *Pearl of the Orient* (1900); *Legends of the Hills* (1901); *For Home and Honor* (1902); *From Switch to Lever* (1902); *Zip the Acrobat* (1902); *Cast Away in the Jungle* (1902); *Post-Boy of the Kanawha* (1902); *The Boy Magician; Comrades under Castro* (1903); *Blue Water Rovers* (1903); *Forge and Furnace* (1903); *Break o' Day Boys* (1903); etc. He writes under the pseudonym of Victor St. Clair.

BROWNE, Hablot Knight (Phiz): 1815–82: English illustrator and caricaturist. He commenced at

school by drawing caricatures upon the benches. After 1839, he illustrated most of the novels of Dickens, Lever, Ainsworth, Mahew, Walter Scott (Abbotsford edition), Byron, etc. He furnished many comical sketches for illustrated publications.

BROWNE, JOHN ROSS: 1817–75; b. Ireland, whence he came to the United States: traveler and author. He was a short-hand reporter in the United States senate. After a voyage in a whale ship, he published *Etchings of a Whaling Cruise, with Notes of a Sojourn on the Island of Zanzibar* (New York, 1846). He went to California 1849, on a mission from the government. On his return from a tour through Italy, Sicily, and Palestine, as newspaper correspondent, he published a humorous work entitled, *Yusef, or the Journey of a Frangi: a Crusade in the East* (1854, illustrated). After another mission to the territories of the northwest and to the Pacific coast, he visited Algeria, Poland, and Russia. He was minister to China 1868–70. His later publications are *Resources of the Pacific Slope* (1869); *The Land of Thor;* and *An American Family in Germany.*

BROWNE, JUNIUS HENRI, American journalist: b. Seneca Falls, N. Y., 1833, Oct. 14; d. New York, 1902, April 2. He was a graduate of Saint Xavier College, Cincinnati. In 1861 he became war correspondent for the New York *Tribune*, was wounded at Fort Donelson, and taken prisoner while engaged in an abortive expedition to run the Vicksburg batteries. After an imprisonment of 20 months in seven different prisons, he eluded his guard at Salisbury, N. C., traveled 400 miles through a hostile country, and reached the Union lines 1865, Jan. 14. His list of Union soldiers who died at Salisbury, published in the *Tribune*, is the only authentic account of their fate. After the War he served as correspondent of the New York *Tribune, Times*, and other journals, and contributed many articles to leading periodicals. His best-known works are: *Four Years in Secessia* (1865); *The Great Metropolis: a Mirror of New York* (1869); *Sights and Sensations in Europe* (1872). A series of articles on women, which he wrote for the *Galaxy*, created a sensation in literary circles.

BROWNE, Sir THOMAS: 1605–82; b. London: antiquary and physician. His father, a merchant, left him an ample fortune, and he was educated at Winchester and Oxford. He began the study of medicine, then travelled over France and Italy, and after taking the degree of M.D. at Leyden, returned and settled (1636) at Norwich, where he practiced as a physician. He was knighted 1671, by Charles II. His chief works are: *Religio Medici* (1642); *Inquiries into Vulgar and Common Errors* (1646); and a *Discourse on Sepulchral Urns* (1648). He wrote also *The Garden of Cyrus, or*

the Quincunxial Lozenge; besides a variety of tracts, published after his death. His writings are prized for genial fancy, pleasing quaintness of style, and varied erudition.

BROWNE, Thomas Alexander (Rolf Boldrewood), Australian romancer: b. London, England, 1826, Aug. 6. He is a son of Capt. Sylvester Browne, a founder of Melbourne, Australia. He was educated in Sidney College, and has written *Ups and Downs: a Story of Australian Life* (1879); *Robbery Under Arms: Life and Adventures in the Bush* (1888); *A Squatter's Dream Story* (1890); *The Miner's Right* (1890); *A Colonial Reformer* (1890); *A Sydney Side Saxon* (1891); *A Modern Buccaneer* (1894); *The Crooked Stick* (1895); *The Sphinx of Eaglehawk* (1895); *The Sealskin Cloak* (1896); *My Run Home* (1897); *Plain Living* (1898); *A Canvas Town Romance* (1898); *The Babes in the Bush* (1900); *In Bad Company* (1901); *Ghost Camp* (1902); etc.

BROWNE, Ulysses Maximilian (Count von), Austrian military officer: b. Basel, 1705, Oct. 23, of an Irish Jacobite family; d. 1757, June 26. He entered the Austrian service at the age of 12, and became one of the foremost field marshals in the army of Maria Theresa. As governor of Silesia (1739–42), he had to face the first of Frederick the Great's attacks, and in the Seven Years' War he commanded the Austrians at Lobositz (1756). He was mortally wounded at the battle of Prague.

BROWNE, William, English poet: b. Tavistock, Devonshire, 1591; d. Ottery Saint Mary, Devonshire, about 1643. He was educated at Oxford, and spent a quiet, tranquil life. His poetry is graceful and fanciful, and abounds in beautiful pictures of English scenery. Browne has always been much admired by the poets. His chief work is Britannia's Pastorals (1613–16). *The Shepherd's Pipe* (1614) is a collection of eclogues, and *The Inner Temple Masque* (1614–15) tells the story of Ulysses and Circe. His minor poems are very fine. The best modern editions are by Hazlitt for the Roxburghe Club, and by Gordon Goodwin, *The Muse's Library.*

BROWNE, William George, English traveler: b. London, 1768, July 25; d. northern Persia, 1813. In several expeditions he traveled through Egypt and some parts of the interior of Africa, and through Asia Minor and Armenia. In 1812 he proposed a more extensive journey through central Asia. He had already, in 1813, arrived at Tabreez, on his way to Tartary, when his party was attacked by banditti and himself murdered. He was the author of *Travels* in Africa, Egypt and Syria (1800).

BROWNE, William Hand, American author: b. Baltimore, 1828, Dec. 31. He studied medicine and gradu-

ated M.D. at the University of Maryland, but soon turned his attention to English literature, in certain departments of which he came to be an authority. He edited the *Southern Review* (1867–8), and the *Southern Magazine* (1870–5); he was librarian at Johns Hopkins University from 1879 to 1891, when he became professor of English literature. He has translated F. Spielhagen's *Hammer and Anvil* (1870); Turgenieff's *Spring Floods* (1874); and Falke's *Greece and Rome* (1882). In collaboration with R. M. Johnston he wrote *Historical Sketch of English Literature* (1872); and a *Life of Alexander H. Stephens* (1878); with J. T. Scharf, *History of Maryland* (1878); and with S. S. Haldeman he compiled *Clarendon Dictionary: Concise Hand-Book of the English Language* (1882). He has also written *George Calvert and Cecilius Calvert, Barons Baltimore; Maryland: the History of a Palatinate* (1884); and has edited *Archives of Maryland: Proceedings and Acts of the General Assembly*, 1637–44 (1883); and *Selections from the Early Scottish Poets.*

BROWNE, William Hardcastle, American lawyer and author: b. Philadelphia, 1840, Nov. 14. In 1865 he was admitted to the Philadelphia bar, where he has since practised, but he is best known for his legal and literary compilations, chief of which are: *Digest of the Law of Divorce and Alimony in the United States* (1890); abridged editions of Blackstone's *Commentaries* (1894); and Kent's *Commentaries* (1895); *Law of Negligence in Pennsylvania* (1896); *Law on Decedents' Estates in Pennsylvania* (1897); *Witty Sayings by Witty People* (1898); *Odd Derivations of Words and Phrases* (1900); *Waverley Novels*, abridged (6 vols. 1901), and others.

BROWNELL, Clarence Ludlow, American journalist and author: b. Hartford, Conn., 1864, June 6. He studied at Harvard University and Stevens Institute of Technology, and for five years was English instructor in government and private schools in Japan. For some years he has been a constant contributor of articles on Japanese life, etc., to American magazines and newspapers, and is steadily at work on a history of Japan and Buddhism in that country. He has written: *Tales from Tokio* (1900); *Hon-gwan-ji at Home and Abroad* (1902); *The Heart of Japan* (1902); *Japanese Wrestling* (1903); *Japanese Archery* (1903); *Japanese Swordsmen* (1903).

BROWNELL, Franklin P., Canadian artist: b. New Bedford, Mass. He makes specialties of portraits and figure-painting. For some years he has been principal of the Ottawa Art School. His canvas, *The Photographer*, is in the National Gallery at Ottawa.

BROWNELL, George Griffin, American educator: b. Fairfield, N. Y., 1898, July 2. He graduated at Syracuse University, 1893, and studied at the Sorbonne,

Paris, 1893–4, and at Johns Hopkins University, 1894–8, when he was appointed professor of Romance languages at the University of Alabama. He wrote for *Harper's Weekly The Lone Star Republic* (1894), and *The Vale of Andorra* (1895); he has edited for college use the Spanish texts *El Capitán Veneno* (1901), and *El Pájaro Verde* (1901); and has contributed frequently to *Modern Language Notes* on subjects relating to the Romance languages and literatures.

BROWN'ELL, Henry Howard: 1820–72; nephew of Bp. Thomas C. B.; b. Providence, R. I.; d. East Hartford, Conn.: author. He graduated at Washington College, Hartford, 1841; studied law, but became a teacher. He served in the U. S. army 1861–63, and in the navy 1863–68. Having turned into verse Farragut's 'General Orders' for the attack of New Orleans, a copy reached the admiral; who opened a correspondence with the author, and in order to gratify his desire of seeing a naval battle, appointed him acting ensign on the flagship *Hartford*. *The River Fight*, and *The Bay Fight* are among the finest of his poems. He published also several works on history.

BROWNELL, Thomas Church, American Protestant Episcopal bishop: b. Westport, Mass., 1779, Oct. 19, d. Hartford, Conn., 1865, Jan. 13. He was graduated from Union College, Schenectady, N. Y., in 1804. The next year he accepted the post of tutor in Latin and Greek in that institution; in 1807 was appointed to the chair of belles-lettres and moral philosophy; and in 1809 was chosen the first professor of chemistry and mineralogy. He entered the Episcopal ministry in 1816, and in connection with his professional duties gave himself to the work of a missionary in Schenectady. In 1818 he became an assistant minister in Trinity Church, New York. He was consecrated Bishop of Connecticut, 1819, Oct. 27, and removed at once to his new field of labor. During his long episcopate of 45 years, Bishop Brownell was actively and efficiently engaged in the duties of his station. Washington (now Trinity) College, at Hartford, Conn., took its rise under his auspices in 1824; and he became its first president, resigning in 1831. In 1852 he became presiding bishop in the American Episcopal Church. He published *The Family Prayer Book* (1823); *Religion of the Heart and Life* (1839–40); *Consolation for the Afflicted; The Christian's Walk and Conversation*, etc. A bronze statue of Bishop Brownell has been placed on the campus of Trinity College.

BROWNELL, William Crary, American essayist and critic: b. New York, 1851, Aug. 30. Having graduated from Amherst, he devoted himself to critical and editorial work in New York City. He became an editor of *Scribner's Magazine* and among his writings are: *French Traits: an Essay on Comparative Criticism*

(1889); *French Art* (1892); *Newport* (1896); and other works.

BROWNIAN MOVEMENTS, *brown'ĭ-an:* unexplained motion of inorganic particles in liquids under the microscope, to which some have mistakenly attributed a kind of vitality. These movements may be observed in a dilution of syrup of orgeat.

BROWNIE, or BROWNY, n. [see BROWN]: a domestic spirit of the fairy order in the old popular superstitions of Scotland; named from supposed tawny color. The common tradition respecting the Brownie is, that he was a good-humored drudging goblin who attached himself to farm-houses and other dwellings in the country, and occupied himself during night, when the family were in bed, in performing any humble kind of work that required to be attended to, such as churning, thrashing corn, etc.—a spirit never seen or spoken to, and known only by the obliging performance of his voluntary labors—a valuable adjunct to the domestic establishment, unfortunately no longer obtainable by housewives. In Cornwall, a goblin known as *Browny* is evoked to assist at the swarming of bees (Borlace's *Antiquities of Cornwall*). The resemblance of the Scotch B, to the *Robin Goodfellow* (q.v.) of the English, and the *Kobold* of the Germans, is so conspicuous that the different fragmentary legends on the subject must be referred to one of the old superstitions prevalent in Europe.

BROWN'ING, ELIZABETH BARRETT: 1809–61; b. near Ledbury, Herefordshire: England's greatest poetess. Her maiden name was *Barrett.* Her youthful culture was far beyond the ordinary education even of 'ladies intellectual.' Classics, philosophy, and science were studied with enthusiasm and success. At a comparatively early period, she became a contributor to periodicals, and a series of articles on the Greek Christian poets indicated both recondite learning and keen poetic insight. Her first important essay in authorship was a translation of the *Prometheus* of Eschylus 1833. In 1838, appeared the *Seraphim and Other Poems,* the external peculiarity of which was its endeavor to embody the ideas and sentiments of a Christian mystery in the artistic *form* of a Greek tragedy. Delicate health, from a rupture of a blood-vessel in the lungs, and the death by drowning of a favorite brother in the following year, compelled her to live in seclusion for a long time. At length her health was restored, and in 1846 she married Robert Browning, the great poet. After their marriage, they resided chiefly in Italy, in whose welfare they were passionately interested. In 1850, Mrs. Browning published her collected works, together with several new poems, among which was *Lady Geraldine's Courtship.* In 1851, appeared the *Casa Guidi Windows,* a poem whose theme was the struggle made

TOMB OF ELIZABETH BARRETT BROWNING, FLORENCE.

by the Tuscans for freedom in 1849. *Aurora Leigh*, her longest production, was published 1856. *Poems before Congress* appeared 1860. Her poetry is distinguished by depth of feeling, true pathos, and noble and generous sentiments. Apparently she poured forth her verse with dangerous facility; and there are few of her poems which would not be improved by the simple process of curtailment. But there is not a thought or a sentiment from her pen which any one would wish expunged. Her influence is unfailingly gentle and ennobling. Her son, Robert Barrett Browning, is an artist.

BROWNING, Orville Hickman, American politician: b. Harrison County, Ky., 1810; d. Quincy, Ill., 1881, Aug. 10. While performing the duties of clerk in the office of the county and circuit clerk of Bracken County, he pursued a course of classical studies at Augusta College. Admitted to the bar in 1831, he settled in practice at Quincy, Ill., where he subsequently resided. In 1832 he served through the Black Hawk war, and was a member of the Illinois legislature, 1836–43. In conjunction with Abraham Lincoln he organized the Republican party in Illinois at the Bloomington convention. When the Civil War broke out he warmly supported the government, and in 1861 was appointed to the United States Senate to fill the vacancy caused by the resignation of Stephen A. Douglas. President Johnson made him secretary of the interior in 1866. and for one year from March 1868 he also acted as attorney-general. In 1869 he was elected to the State Constitutional Convention, and after that he retired to the practice of his profession.

BROWNING, Oscar, English author: b. London, 1837, Jan. 17. He was educated at Eton and at King's College, Cambridge, where he was graduated with classical honors in 1860. From 1860 to 1875 he was a master at Eton, and since 1876 has been lecturer in history and political science at Cambridge. He has also served as principal of the University Training College for teachers, and in other educational capacities. Twice he has been an unsuccessful candidate of the Liberal party for Parliament. He is a voluminous writer on subjects of education, history, biography, etc., and among his works are: *Cornelius Nepos* (1868); *Netherlands in the 16th Century* (1869); *Thirty Years' War* (1870); *Modern England* (1879); *Modern France* (1880); *History of Educational Theories* (1881); *History of England* (1890); *Life of George Eliot* (1890); *Goethe: Life and Works* (1891); *The Citizen: His Rights and Responsibilities* (1893); *Life of Peter the Great* (1898); *Wars of the 19th Century* (1899); *History of Europe 1814–43* (1901); *Letters from India* (1902); *Political Memoranda of the Duke of Leeds* (1884); *Earl Gower's Despatches* (1885); *England and*

Napoleon in 1803 (1887); *Dante, Life and Works* (1891); *Aspects of Education* (1888); *Milton's Tractate on Education* (1883); *True Stories from English History* (1886); *Life of Bartolommeo Colleoni* (1891); *The Flight to Varennes and other Historical Essays* (1892); *Guelphs and Ghibellines* (1894); *The Age of the Condottieri* (1895); *Charles XII. of Sweden* (1898); *Napoleon: The First Phase* (1905); etc.

BROWN'ING, ROBERT: English poet and dramatist: 1812, May 7—1889, Dec. 12; b. Camberwell near London; son of a clerk in the Bank of England. When 12 years old, he tried in vain to find a publisher for some crude Byronic poems. The influence of Byron soon yielded to that of Shelley and Keats. Browning at first went to school at Peckham, and afterward studied under a private tutor. He matriculated at the London Univ., but did not graduate. In 1833 he published anonymously *Pauline*, a poem containing all the faults that later hardened into mannerisms, and in a style strained, turgid and obscure but also foreshadowing the dramatic force and the vigor of thought that were to come. Browning travelled in 1834, lingering in St. Petersburg and Italy, imbibing in Italy that love for and intimate acquaintance with mediæval and monastic history and tone of thought shown impressively in his poems. 1846, Sep. 12, Browning married Elizabeth Barrett, the poetess, after a long and romantic courtship, against her father's opposition. They went at once to Italy and settled in the Casa Guidi palace at Florence, where, with occasional visits to Pisa for health, they passed a singularly happy life. In 1859 the Brownings kindly assumed the care of Walter Savage Landor, who was then rapidly failing. In 1861 Mrs. Browning died, and Browning returned to England; but till his death in Venice, he made frequent and prolonged visits to his beloved Italy. In 1867 he received from the Univ. of Oxford the honorary degree A.M., and was elected honorary fellow of Balliol College. The incidents of his life—a life not marred by any so-called eccentricities of genius or domestic infelicities, but passing peacefully on amid the growing admiration of a discriminating audience—are of little interest compared with the story of the course, development, and character of his genius. The following is a list, in chronological order, of his principal productions: *Paracelsus* (1835); *Strafford*, tragedy, produced (1837) at Covent Garden, with Macready in the title rôle; *Pippa Passes, Kings Victor and Charles, Return of the Druses* (1837–39); *Sordello* (1840); *Blot in the 'Scutcheon*, a play produced (1843) at Drury Lane; *Colombe's Birthday*, produced (1853) at the Haymarket, with Helen Faucit in the leading rôle; *Men and Women* (1855); *Dramatic Person* (1864); *The Ring and the Book* (1868–9); *Balaustion's Adven-*

ture (1870); *Prince Hohenstiel-Schwangau* (1871); *Fifine at the Fair* (1872); *Red Cotton Night-Cap Country* (1873); *Aristophanes' Apology* (1875); *Pacchiarotto* (1876); *The Agamemnon* (1877); *La Saisiaz* and *The Two Poets of Croisic* (1878); *Dramatic Idyls* (1879); *Dramatic Idyls*, second series (1880); *Jocoseria* (1883).

Browning's place is, unquestionably, among the greatest English poets. To this rank he is entitled for his intense dramatic force, the power and value of his thoughts, his gift of subtle psychological analysis, the daring and sustained sweep of his imagination, his virile diction, and his piercing spiritual insight. Browning at times reminds us of Shakespeare in the poise and catholic calm of his intellectual attitude, and again at times in the magnificent rush of his passions; but he lacks the crystalline clearness of the earlier poet. The river of Shakespeare's poetry at its deepest depth is clear; the stream of Browning's verse is often turgid with the over-strenuousness of his thought. Shakespeare is a giant with the beauty and grace of Apollo; Browning has rather the rugged grandeur of one of Michelangelo's statues. The blind devotees of Browning deem his mystic obscurity peculiarly precious as provocative of thought; but it is worth considering whether that which is a virtue in the *prophet* is not alien to the mission of the *poet*. Browning was a strenuous worker; we are tempted to say that he was too eagerly absorbed in thinking out the problems that he set for himself to care for mere lucidity. As he has said 'Success is naught, endeavor's all.' But he could be at once intensely clear and intensely suggestive, as witness that wonderful little poem *The Patriot*. Its dramatic force and piercing pathos are supreme, yet all is suggested, not described, in fewest words of almost homely simplicity. The spiritual grandeur of *The Tyrant* is sublime; the very workings of the man's mind are laid pitilessly bare. His victim, hunted remorselessly into the last haunt of despair, suddenly 'caught at God's skirts and prayed, . . . and I—I was afraid.' The weird suggestiveness of *Childe Roland to the Dark Tower Came* is awesome. *Bishop Blougram's Apology* takes us inside the very crawling soul of the able and contemptible prelate. Sometimes the poet's subtle analysis, true and powerful as it is, is so long drawn out as to become wearisome, as in *The Ring and the Book*. In making his characters impress themselves upon and explain themselves to the reader, B. is not surpassed by Shakespeare himself: we can give no higher meed of praise to his dramatic instinct than to call attention to the fact that he relies on self-revelation rather than description to produce his most potent effects.

Browning had in him a glorious vein of ballad music. *How We Brought the Good News from Ghent to Aix*

pulses with the very music of motion; the hoofs beat and the air rushes through every line. Browning's clear-eyed faith in the reality of the spiritual nature of man has been very helpful in a generation which listens, perhaps, with more pleasure to a cultured agnosticism through which the 'larger hope' but faintly breathes. It would be rash to prophesy a continued and wide popularity for Browning's poetry; but it would be hazardous to predict that his audience will in the future be few as well as fit. He stands out in rugged grandeur among the poets of the 19th c., like the Matterhorn among the surrounding Alps. Compared with Tennyson, Browning is as uncouth as was Johnson in comparison with Goldsmith; he has at times a disdain of grace, he clips his words as though stuttering with the rapidity of utterance. But notwithstanding all his faults, he was great. He was a great poet; he was a still greater prophet.

BROWN'ISTS: sect in the 16th c., maintaining a rude and extreme independency in church polity. The sect was not permanent—soon giving place to the Independents, (q.v.) or Congregationalists, (q.v.), who with the Baptists, (q.v.), maintain the principle of self-government of the local church under Christ, but balanced and adjusted by the cognate principle of the universal fellowship of churches. See BROWN, ROBERT. Adherents of the Brunomian system of medicine; see BROWN, JOHN, M.D.

BROWNLEE, WILLIAM CRAIG, American clergyman: b. Torfoot, Lanarkshire, Scotland, 1784; d. New York, 1860, Feb. 10. His paternal ancestors for many generations were the 'Lairds of Torfoot.' He graduated M.A. at the University of Glasglow, was licenced to preach, and came to America in 1808. For a time he taught Latin and Greek in Rutgers College, but in 1826 was installed as one of the ministers of the Collegiate Reformed Dutch Church in New York city. He was a vigorous controversialist, earnestly opposing the Quakers and Roman Catholics. His writings include: *Inquiry into the Principles of the Quakers* (1824); *The Roman Catholic Controversy* (1834); *Treatise on Popery* (1847); *Lights and Shadows of Christian Life* (1847); *Deity of Christ; History of the Western Apostolic Church* and some minor religious tracts and pamphlets.

BROWNLOW, *brown'lō*, WILLIAM GANNAWAY: 1805–77; b. Va.: Methodist minister, journalist, and politician. Left an orphan at eleven years, with no financial resources; he learned the carpenter's trade, and worked on it until he had means to repair the defects of his early education; and then applied himself to study with that feverish passion which he carried into every act of his life. He joined the Methodist Church 1826, and was for 10 years itinerant preacher. In 1828, he

W G. BROWNLOW.

favored the election of Pres. Adams; began to edit the *Knoxville Whig* 1837; and during the nullification agitation favored the Union. B. was always ardent, fearless, and aggressive. Before the rebellion, he had favored slavery; but when the crisis came, he proved a firm unionist, and was imprisoned by the Secessionists for several months during the winter of 1861–2. He was gov. of Tennessee 1865–69; then U. S. senator. He wrote: *The Great Iron Wheel Examined* (1858), a defense of Methodism; *Sketches of the Rise, Progress, and Decline of Secession; With a Narrative of Personal Adventures Among the Rebels* (1862); and, with Prynne *Ought American Slavery to be Perpetuated?* A Debate at Philadelphia, September 1858, in which Brownlow took the affirmative side (1858).

BROWN PIGMENTS: in *art*, those substances in which the three primary colors unite in unequal proportions, red being in excess. B. P. are chiefly mineral, and are used sometimes in a raw but usually in a burned state. The most important are bistre, asphaltum, umber, terra di sienna, Mars brown, Cassel earth, and brown madder.

BROWNS: on porcelain; generally imparted by a mixture containing sulphate of iron: see POTTERY.

BROWNS on cloth are communicated by arnotto (q.v.) and copperas, assisted by fustic, sumach, peachwood, logwood, and alum: see DYEING.

BROWNSON, *brown'sŭn*, HENRY FRANCIS, American lawyer and author: b. Canton, Mass., 1835, Aug. 7. He graduated at Holy Cross College, Worcester, Mass., and was admitted to the bar September 1856, after having studied for some years in Paris and Munich. From June 1861 to January 1871 he served in the United States army, chiefly in the artillery, and attained the rank of brevet-major. He wrote various articles for *Brownson's Quarterly Review* (1853–61), but has chiefly devoted himself to editing the works of his father, Orestes A. Brownson; namely, *Works of O. A. Brownson* (1883–7); *Literary, Scientific, and Political Views of O. A. Brownson* (1893). He has also written *Religion of Ancient Craft Masonry* (1890); *Faith and Science* (1895); *Equality and Democracy* (1897); *Early, Middle, and Latter Life of O. A. Brownson* (1898–1900).

BROWNSON, ORESTES AUGUSTUS, LL.D., 1803–77; born Stockbridge, Vt. At the age of 19 years he joined the Presb. Church; but (1825) he became a Universalist preacher. Imbibing the ideas of Robert Owen, he entered politics 1828; and was instrumental in establishing a workingmen's party in New York. Influenced by the writings of Dr. Channing, he became a Unitarian preacher 1832. He now applied himself to philosophy and theology, studying the French philosophers. In 1836, he published *New Views of Christianity, So-*

ciety, and the Church; and in the same year organized at Boston 'The Society of Christian Progress,' of which he was leader till 1843, though he had stopped preaching before that time. He founded, 1838, the *Boston Quarterly Review,* merged into the New York *Democratic Review* 1843. The romance of his intellectual career was ended in 1844, when he joined the Rom. Cath. Church; to which he thenceforward gave powerful support. In 1840 he published *Charles Ellwood, or the Infidel Converted,* a novel in which he portrays his own religious and philosophic wanderings. He was a voluminous writer; and all his works evince originality, brilliancy, and immense knowledge.

BROWN SPAR: name often given by mineralogists to frequent varieties of dolomite (q.v.), or magnesian limestone, distinguished by a brownish or reddish color, and a pearly lustre, on account of which they are sometimes called also *pearl spar.*

BROWNSTONE, the reddish-brown sandstone of the Triassic Age, so named originally in the Eastern United States, where it occurs in New Jersey and Connecticut. The name is now generally used for any brown sandstone adapted for building purposes, but the most important stones included under this name are those just mentioned, which are quarried at Portland and Middletown, Conn., and the Cambrian or Pre-Cambrian sandstones that are worked near Marquette, Mich. The use of brownstone has greatly diminished in recent years, granite and limestone having largely superseded it in public favor.

BROWN'S TRACT ('John Brown's Tract'): a portion of the w. slope of the Adirondack region, near the head waters of the streams that flow into the Black river. It comprises 210,000 acres, and originally formed a part of what is known as Macomb's purchase. It was bought at a foreclosure sale in 1798, for $33,000, by John Brown, a rich merchant of Providence, R. I., who led the party that destroyed the British schooner *Gaspee,* in Narragansett Bay, 1772. For 20 years he was treasurer of Brown's Univ., which was named in honor of his family, and he laid the corner-stone of the edifice. The tract purchased by him was divided into eight townships, and it is said that Aaron Burr had, at one time, some interest in the property, though this was doubtless prior to its purchase by Brown, who died and left it a wilderness.

BROWNSVILLE: town, port of entry, cap. of Cameron co., Tex.: on the Rio Grande, 35 m. from the Gulf of Mexico and on the Rio Grande R. R. It is opposite Matamoras, Mexico, 22 m. from Point Isabel on the Gulf coast. Its prosperity is due chiefly to its trade, of which the steam navigation of the Rio Grande forms the principal part. It has several churches, a convent, a college, a custom-house, and several news-

papers. It is also the seat of a vicar-apostolic of the Rom. Cath. Church. A short distance e. of B. is Fort Brown, garrisoned by U. S. troops. In May, 1846, Brownsville was occupied and fortified by a small body of United States troops, who maintained their position in the face of a heavy bombardment that lasted for 160 hours, and in November 1863 it was taken from the Confederates by a Federal army under Gen. Banks. Pop. (1900) 6,305; (1910) 10,517.

BROWN UNIVERSITY; at Providence, R. I.; organized at Warren 1764, as the Rhode Island College. In 1770, it was removed to Providence, and in 1804 it received its present name in honor of Nicholas Brown (q.v.), one of its most munificent patrons. It has always been under the direction of the Baptists; but its instruction is not sectarian. The buildings, over half a dozen in number, are on an elevation, surrounded by a beautiful campus of 16 acres adorned with shade trees, mostly elms. The grounds and buildings are valued at $1,500,000, the productive funds amount to over $3,150,531, and the annual income is about $400,000. The college has about 100 scholarships, 64 of which are of $1,000 each. Thirty scholarships are sustained by a state fund of $50,000. There is also an aid fund of several thousand dollars, the income of which is used to assist young students of limited means. It has an excellent library, numbering 140,000 vols. and a valuable collection of pamphlets. There is also a museum of natural history containing valuable collections. The catalogue of 1906 reported 81 professors and instructors, 937 students in all grades, and 6,620 graduates. In 1891 the Woman's College was founded. The institution has grown very rapidly; a $2,000,000 endowment has been secured; and several large and important buildings have been erected, including the John Carter Brown Library, the Administration Building, the Engineering Building, Caswell Hall, and Rockefeller Hall.

BROWNWOOD, Texas, a city and countyseat of Brown County, situated on the Gulf, C. & S. F., and the Fort Worth & R. G. R.R.'s, 140 m. n.w. from Austin. It was settled in 1866 and incorporated in 1878. It trades in wheat, hay, cotton, cattle, hides, and pecan nuts. There are flour mills, cotton-seed-oil mills, and manufactories of wire-fencing, saddle and harness, ice, etc. Here are located the Daniel Baker College, and the Howard Payne College. The city owns its waterworks. Pop. (1900) 3,965; (1910) 6,967.

BROWSE, v. *browz* [F. *brouter*, and *brouster*, to nibble off the sprigs and buds—from OF. *broust*, a sprig: Sp. *broza*, brushwood: mid. L. *brustum*, pasture]: to eat the tender leaves and branches of trees and shrubs, BROW'SING, imp. eating tender leaves and branches; pasturing on fields; grazing. BROWSED, pp. *browzd*.

BRUCE.

BRUCE: surname of a family illustrious in Scottish history, descended from Robert de Bruis, a Norman knight, who accompanied William the Conqueror to England 1066, and died soon afterward.

His younger son, Adam, who acquired large possessions in Yorkshire, left a son, Robert de Brus of Cleveland, companion in arms of Prince David of Scotland, afterward David I., from whom he received a grant of the lordship of Annandale, held by the tenure of military service. At the commencement of the war in England between Stephen and Matilda, niece of the King of Scots, Robert de B. adhered to the former, and renounced his allegiance to David, resigning his lands in Annandale to his son Robert. In 1138 he was sent by the barons of the north of England to negotiate with David, who had advanced in support of his niece's claims as far as Northallerton, Yorkshire. In the battle of the Standard which followed he took prisoner his son Robert, then fourteen years of age, who, as lord of Annandale, fought on the Scottish side. He died 1141, and his English estates were inherited by his eldest son, Adam, whose male line terminated in Peter de B. of Skelton, constable of Scarborough Castle 1271.

Robert de B., 2d lord of Annandale, had two sons: Robert—who married a natural daughter of William the Lion, and died, without issue, before 1191—and William, whose son, Robert, 4th lord of Annandale, married Isobel, second daughter of David, Earl of Huntingdon and Chester, brother of William the Lion, and thus laid the foundation of the royal House of Bruce. He died 1245.

BRUCE, Robert, King of Scotland: 1274, Mar. 21—1329, June 7 (reigned 22 years); eldest son of Robert, Earl of Carrick who died 1304. This most heroic of the Scottish kings in youth favored the English interests, in the expectation, doubtless of his father being preferred to the Scottish throne. In 1296, as Earl of Carrick, he swore fealty to Edward I. at Berwick, and the following year he renewed his oath of homage at Carlisle. Shortly afterward, he abandoned the cause of Edward, and, with his Carrick vassals, joined the Scottish leaders in arms for the independence of their country. On the defeat of the Scots, a few months afterward, at Irvine, B. made his peace with the English monarch. After Wallace's defeat at Falkirk, B. burned the castle of Ayr to the ground, to prevent its falling into the hands of the English, and retired into the recesses of Carrick. In 1299, the year after Wallace had resigned the regency, B., then in his 25th year, was admitted one of the four regents, who ruled the kingdom in the name of Baliol. In the three campaigns which subsequently took place, previous to the final subjugation of Scotland, B. continued faithful to Edward, and in 1305 was consulted in the settlement of the government. With John Comyn, called the Red Comyn, nephew of Baliol, he appears to have entered into some agreement as to their rival claims to the throne. In an interview between them, in the church of the Minorite Friars, Dumfries, 1305–6, Feb. 4, a quarrel took place, and B., in a paroxysm of passion,

stabbed Comyn with his dagger. Rushing out to his attendants, he exclaimed: 'I doubt I have slain the Red Comyn.' 'You doubt!' cried one of them; 'I mak sikker!' (i.e. sure), and running into the church with some others, slew Comyn and his brother, who attempted to defend him. B. hastened to Lochmaben Castle, assembled his vassals, and asserted his right to the throne. Two months after (Mar. 27), he was crowned king at Scone. An English army, under the Earl of Pembroke, nominated by Edward, gov. of Scotland, took possession of Perth, and, on the night of June 18, attacked B. in the wood of Methven, compelling him to retreat into the wilds of Athole. At Dalry, near the head of Loch Tay, B. was attacked by Alexander, Lord of Lorn, chief of the Macdougals, husband of the aunt of the Red Comyn, and compelled to retire. Sending his queen and her ladies to Kildrummie Castle, Aberdeenshire, under the charge of Nigel Bruce and the Earl of Athole, he, with 200 followers, crossed Loch Lomond, and had recourse for subsistence to the chase. B. next took refuge in the little island of Rathlin, on the n. coast of Ireland, where he remained all winter, and was supposed to be dead. In his absence, the English took the castle of Kildrummie, hanged Nigel Bruce and other chiefs who had defended it, and tore the queen and Princess Marjory from the sanctuary of St. Duthac, Rossshire. All B.'s estates were confiscated, and he and his adherents excommunicated by the pope's legate at Carlisle. In the spring of 1307, with about 300. men, B. landed in Carrick, and at midnight surprised the English garrison in his own castle of Turnberry; but before a superior force he retired into the mountainous districts of Ayrshire. At Loudon Hill 1307, May 10, he defeated the English under the Earl of Pembroke, and, three days after, overthrew another party under the Earl of Gloucester. In less than two years he wrested from the English nearly the whole of Scotland. His authority being now established, in 1309 B. advanced to Durham, laying waste the country. The same year, Edward II. of England invaded Scotland, but was compelled to retreat from Edinburgh to Berwick-upon-Tweed. In the harvest of 1312, the Scots again invaded England, but unsuccessfully. B. now reduced the Isle of Man also. On his return in the autumn of 1313, he found his brother, Edward Bruce, engaged in the seige of Stirling Castle, held by Sir Philip Mowbray for the English. A treaty was entered into, by which Mowbray bound himself to surrender it, if not relieved before June 24 following. This led to the memorable battle of Bannockburn, 1314, June 24, at which B. commanded in person. The English, under Edward II., amounting, it is said, to about 100,000 men, were totally routed, leaving 30,000 dead upon the field; while the Scots, numbering only 30,000, and 15,000 camp-followers, lost about 5,000. In 1317, B. passed over to Ireland, to assist his brother, Edward, elected king of that country, and defeated the Anglo-Irish under the Baron of Clare; and in the spring of 1318 the Scots army invaded England by Northumberland. Another invasion

of Scotland by the English king, who was compelled to retreat, was followed by B. again marching into England. After besieging Norham Castle, he defeated Edward once more at Biland Abbey, Yorkshire. A truce was, in consequence, ratified between the two kingdoms at Berwick; 1323, June 7, to last 13 years. On the accession of Edward III., 1327, hostilities recommenced; and the Scots being again victorious, a final treaty was ratified in a parliament at Northampton 1328, Mar. 4, recognizing the independence of Scotland, and B.'s right to the throne. His warfare was now accomplished, and suffering under the disease of leprosy, he spent the last two years of his life at Cardross Castle, on the n. shore of the Firth of Clyde. His heart, extracted and embalmed, was delivered to Sir James Douglas, to be carried to Palestine and buried in Jerusalem. Douglas was killed fighting against the Moors in Spain, and the sacred relic of B., with the body of its devoted champion, was brought to Scotland, and buried in the monastery of Melrose. B.'s body was interred in the Abbey Church of Dunfermline; and, in clearing the foundations for a third church on the same spot 1818, his bones were discovered. He was twice married: (1) to Isabella, daughter of Donald, tenth Earl of Mar; issue, a daughter, Marjory, wife of Walter the high steward, whose son ascended the throne as Robert II.; (2) to Elizabeth, daughter of Aymer de Burgh, Earl of Ulster; issue, one son, who succeeded him as David II., and two daughters.

BRUCE, DAVID (DAVID II., King of Scotland): 1324—1371, Feb. 22; son of King Robert Bruce; succeeded his father when only five years old. In terms of the treaty of Northampton, he had married, when four years old, Joanna, daughter of Edward II. of England, and 1331, Nov. 14, he was crowned with her at Scone. In 1333, the success of Edward Baliol and the English party forced David's guardians to send him and his consort to France; but on the dispersion of Baliol's adherents, David returned to Scotland 1341. He made three unsuccessful inroads into England, and on a fourth invasion, 1346, was taken prisoner at the battle of Neville's Cross, near Durham, and conveyed to to the Tower of London. Thence he was removed to Odiham, in Hampshire, and not released till 1357, when his ransom was fixed at 100,000 marks. His queen dying 1362, he married Margaret Logie, a Scottish gentlewoman of singular beauty, whom he divorced 1370. He had no issue; and in his latter years he was engaged in several intrigues with England, with the view of excluding his nephew, Robert, the steward of Scotland, the next heir, from the throne. He died at Edinburgh Castle.

BRUCE, EDWARD, King of Ireland: d. 1317, Oct. 5; brother of King Robert Bruce. He was a chivalrous but rash and impetous prince; was actively engaged in the struggle for Scotland's independence; and 1308, after defeating the English twice, made himself master of Galloway. In 1315, the chieftains of Ulster tendered to him the crown of Ireland, on condition of his assisting them to

expel the English from the island. With a small army of 6,000 men, he embarked at Ayr, and reached Carrickfergus May 25, accompanied by Sir Thomas Randolph, Earl of Moray, Sir John of Soulis, Sir John the Stewart, Sir Fergus of Ardrossan, and other Scottish knights of renown. His rapid victories soon made him master of the province of Ulster, and he was crowned King of Ireland, 1316, May 2, but was slain less than 18 months afterward at the battle of Dundalk.

BRUCE, GEORGE: 1781–1866; b. Edinburgh, Scotland; came to America 1795, following his brother David, who had emigrated earlier. He first apprenticed himself to a printer at Philadelphia, but after several years he and his brother went to New York; and 1806–16 did a prosperous business in book-printing. After 1818 George B. confined his attention to type-founding and made valuable improvements in the art; he and his nephew invented a type-casting machine, still in use. B. was a man of integrity and ability; and held prominent positions in various learned societies and trade-unions.

BRUCE, JAMES: traveller: 1730, Dec. 14—1794, Apr. 27; b. at Kinnaird House, Stirlingshire, Scotland; eldest son of David Bruce, of Kinnaird. Educated at Harrow, he was sent, in the winter of 1747, to the Univ. of Edinburgh, with the intention of studying law; but changing his views, he went to London, and having, 1754, Feb., married the daughter of a wine-merchant's widow, became a partner in the business. His wife dying within a year, he made a tour on the continent, and on his father's death 1758, he succeeded to the estate of Kinnaird. In 1761 he retired from the wine trade, and in 1763 was appointed consul-gen. at Algiers. He remained there about two years, studying the oriental languages, and acquiring the rudiments of surgery. He then went to Aleppo, where he took further instructions in the medical art, being resolved to travel in the character of a physician. In 1768, June, he proceeded to Alexandria, and from Cairo set out on his famous journey to Abyssinia, which forms an epoch in the annals of discovery. Sailing up the Nile to Syene, he crossed the desert to Cosseir, and arrived at Jeddah 1769, Apr. After various detentions, he reached Gondar, cap. of Abyssinia, 1770, Feb.; and Nov. 14, succeeded in reaching the sources of the Abawi, then considered the main stream of the Nile. This accomplishment of the chief object of his journey filled him with exultation. He remained about two years in Abyssinia, and returning by way of Sennaar and the desert of Assouan, after great hardship reached Alexandria, whence he embarked, 1773, Mar., for Marseilles. In France he spent considerable time, visiting the celebrated Count de Buffon, and other distinguished men, and 1774 he returned to Scotland. In 1776, he married Mary, daughter of Thomas Dundas, Esq., of Fingask, by whom he had two sons and one daughter. His long-expected *Travels to Discover the Sources of the Nile, in the Years* 1768–1773, were published 1790, 5 large 4to,

vols., with plates and charts. The work contained such curious accounts of the manners and habits of the people of Abyssinia that it startled the belief of many, and some of his statements were set down as fabrications. Among other doubters were De Tott in France, and Dr. Johnson in England. Modern travellers, including Salt, Pearce, Burckhardt, Belzoni, and others, have, however, fully confirmed his statements. B. died at Kinnaird, of a fall down-stairs.

BRUCE, Michael: minor Scottish poet: 1746, Mar. 27—1767, July 6; b. Kinneswood, Kinross-shire, Scotland; son of a weaver: was, in his younger years, employed as a herd-boy. In 1762, he was sent to Edinburgh Univ. to study for the ministry, and when not at college, was engaged as a village schoolmaster. He had all his life to struggle with poverty, and his frame being weak, melancholy took possession of his mind, his constitution began visibly to decline, and he died of consumption. His poems, few in number, and of a tender and pathetic description, were published by the Rev. John Logan, his fellow-student and associate at college, Edinburgh, 1770. His last composition was a touching elegy on his own approaching death.

BRUCE, Robert de, fifth lord of Annandale: 1210–95; son of Robert fourth lord; and competitor with John Baliol for the crown of Scotland. On the death of his mother, the Princess Isobel, 1252, he did homage to Henry III. for her lands in England, and in 1255 was made sheriff of Cumberland, and constable of the castle of Carlisle. About the same time he was appointed one of the fifteen regents of Scotland, in the minority of Alexander III. In 1264, he led, with Comyn and Baliol, the Scottish auxiliaries to the assistance of the English monarch at the battle of Lewes, where he was taken prisoner, but released after the battle of Evesham, the following year. On the Scottish throne becoming vacant at the death, 1290, of Margaret, the 'Maiden of Norway,' granddaughter of Alexander III., Baliol and Bruce claimed the succession, the former as great-grandson of David, Earl of Huntingdon, by his eldest daughter, Margaret; the latter as grandson, by the earl's second daughter, Isobel. Edward I. of England, to whom the dispute was referred, decided in favor of Baliol, 1292, Nov. 19. To avoid swearing fealty to his successful rival, B. resigned Annandale to his eldest son, Robert de B., Earl of Carrick. He died at his castle of Lochmaben, Dumfriesshire, leaving three sons and a daughter.

BRUCE, Robert de, Earl of Carrick: d. 1304; eldest son of Robert, fifth Lord of Annandale: accompanied King Edward I. of England to Palestine 1269, and was ever afterward greatly esteemed by that monarch. On his return to Scotland, he married, 1271, Martha Margaret, Countess of Carrick, and in her right became Earl of Carrick. Following the example of his father, to avoid doing homage to Baliol, he resigned the lordship of An-

nandale to his eldest son, Robert, future king of Scotland, then a minor. Retiring to England, he was, on the death of his father, 1295, appointed constable of castle of Carlisle; and in the following year, when Baliol renounced the authority of Edward, and assisted by the Comyns, had recourse to arms, B. fought on the side of the English. After the battle of Dunbar, in which the Scots were defeated, and Baliol compelled to relinquish the sovereignty, he made application to Edward for the vacant crown, but was refused it.

BRUCEA, *brôs'ē-a:* genus of shrubs somewhat doubtfully referred to one or other of the allied natural orders *Rutaceæ* (q.v.), *Simarubaceæ* (q.v.), and *Xanthoxylaceæ* (q.v.).—*B. antidysenterica,* or *ferruginea,* is an Abyssinian species, the leaves of which are said to be tonic, astringent, and useful in dysentery. Those of *B. Sumatrana,* native of the Indian archipelago, China, etc., have the same medicinal properties. They are intensely bitter

BRUCHSAL, *brûĸ'sâl:* town of the grand duchy of Baden; on the Salzbach, and on the railway between Heidelberg and Carlsruhe, 12 m. n.e. of Carlsruhe. B., a place of considerable antiquity, has three suburbs. The old castle of the prince-bishops of Speier, who took up their residence here early in the 11th c., is still standing, and in the church of St. Peter are some ancient tombs. The people are engaged chiefly in the wine trade. B. has two prisons organized on a modified form of the Pennsylvania system. Pop. 11,902.

BRUCHUS, n. *brô'kŭs* [L.]: a genus of beetles belonging to the section *Tetramera,* and the family *Rhyncophora* or *Curculionidæ.* It contains small beetles which deposit their larvæ in the germs of leguminous plants, and when hatched devour their seed. *Bruchus Pisi* is destructive to the garden-pea. The holes so often observed in peas are made by this insect to effect its escape.

BRUCINE, n. *brôs'ĭn,* an alkaloid discovered in 1819, and obtained in the preparation of strychnine, from which it is separated by boiling alcohol. It crystallizes in white and transparent prisms, with a rhomboidal base. It has a very bitter taste, but no smell, and is less poisonous than strychnine. It is insoluble in ether, and dissolves in a mixture of 850 parts of cold and 500 parts of boiling water. Nitric acid gives it a scarlet, and sulphuric acid a rosy tint, but both turn gradually to yellow. A solution of copper turns it to violet. These reactions distinguish brucine both from strychnine and morphine. The salts of brucine are tolerably numerous, and are prepared by double decomposition, or by direct combination of the brucine with the acid. They are for the most part crystallizable, and like the base have a bitter taste. They are not used in medicine. Symbol $C_{23}H_{26}N_2O_4 + 4H_2O$.

BRUCITE, n. *brôs'īt* [after Dr. *Bruce* of New York]: a mineral, a native hydrate of magnesia, occurring in serpentine in New Jersey, and in mines of chrome in Texas: sym. MgH_2O_2.

BRÜCKENAU, *brük'hen-ow:* village of Bavaria, on the Sinn, 36 m. n.e. of Würzburg. It is famous in connection with the baths of Brüchenau, picturesquely situated in a beautiful part of the valley of the Sinn, about 2 m. w. from the village. The grounds are tastefully laid out in gardens, and charming walks traverse the surrounding woods. The place is a favorite summer resort of the Bavarian court. B. has paper-mills. Pop. 2,000.

BRUCKER, *brûk'kér*, JOHANN JACOB: 1696–1770; b. Augsburg: German historian, and divine. After a brilliant career as a student at Jena, he became a successful preacher of the Reformed Church. His history of philosophy, *Historia critica philosophiæ a mundi incunabulis ad nostram usque ætatem deducta* (Leipsic, 1741–44, 5 vols. 4to, reprinted with a 6th vol. 1767), is the great work of his life, which placed him in the first rank among German scholars and philosophers of the 18th c. in Germany. The number of his publications was very great. He was correcting and superintending Luther's translation of the New Testament, when his death at Augsberg cut short his work.

BRÜGES, *brü'jĕz*, Fr. *brüzh* (Ger. *Brügge*): city of Belgium, cap. of the province of West Flanders; in a fertile plain about 8 m. from the sea, with which it is connected by the three canals from Ghent, L'Ecluse, and Ostend, the latter admitting the largest sea-going ships; lat. 51° 12′ n., long. 3° 14′ e. Brüges derives its name from its many bridges, all opening in the middle for passage of vessels. The ramparts surrounding the city are an agreeable promenade. The streets have a venerable and picturesque appearance, but they are greatly deserted, the population of the city being now scarcely a quarter of what it was during the middle ages. Among the most interesting buildings are the town hall, with a lofty tower and a celebrated set of 48 bells; a Gothic senate-house, built about the close of the 14th c.; a court of jusice containing a famous carved chimney-piece of 1559; the church of Notre Dame, with its spire 450 ft. high, its many valuable paintings, and a statue of the Virgin (said to be by Michael Angelo), for which Horace Walpole offered 30,000 florins, and its splendid monuments of Charles the Bold and his daughter Mary, wife of the Emperor Maximilian; the cathedral of St. Sauveur, not remarkable for its exterior, but containing paintings by eminent masters; St. John's Hospital, with celebrated pictures by Memling, etc. The Acad. of Painting contains several fine pictures by J. van Eyck. Brüges has manufactures of woolen, linen, cotton, lace, leather, cord-

age, and tobacco; and distilleries, sugar and salt refineries, and ship-building yards. Railways connect B. with Ostend, Ghent, and other cities of Belgium and the continent. Brüges is a very ancient city. Here, it is said St. Chrysolus preached the gospel as early as the 3d c. In the 7th c., Brüges was the cap. of the surrounding dist. called Flanders, and before the conquest of England by the Normans, its commercial importance was established. In the beginning of the 13th c. it was the central mart of the Hanseatic League; and in the following century it may be said to have become the metropolis of the world's commerce. Commercial agents from 17 different kingdoms resided here, and no less than 20 ministers from foreign courts had mansions within its walls. Its population at this time amounted to upward of 200,000. In 1488, the citizens rose in insurrection against the Archduke Maximilian, and with harsh measures of repression which ensued commenced the commercial decline of Brüges. Many of the traders and manufacturers, driven forth from their own country, settled in England, and from this time may be dated the beginning of English manufacturing superiority. In the 16th c., however, the tapestry of Brüges was still celebrated throughout Europe, and the famous Gobelin tapestry of Paris is said to owe its origin to a manufacturer of Brüges. The city was taken by the French 1794, and soon after incorporated with the French empire; but in 1815 it became a part of the kingdom of the United Netherlands, and in 1830 of the Belgian monarchy. Pop. (1900) 52,867.

BRUGG, *brûg*, or BRUCK, *brûk:* village of Switzerland, canton of Aargau, on the right bank of the Aar, near the mouth of the Reuss, about 9 m. n.e. of Aaran. It is interesting as occupying a part of the site of the ancient *Vindonissa*, the strongest fortress as well as the most important settlement of the Romans in Helvetia; and also as the cradle of the House of Hapsburg, to whom, in early times, it belonged. The remains of the castle of Hapsburg, founded by Count Radbod of Altenburg 1020, are still seen on a wooded height, about 2 m. from the village. Nearer, is the abbey of Königsfelden, founded 1310 by the wife and daughter of the Emperor Albert, who, two years before, was murdered on the spot by his nephew and others, for which a terrible revenge was taken on the relatives of the murderers. Pop. abt. 1,500.

BRUGMANN, *brûg'măn*, FRIEDRICH KARL, German philologist: b. Wiesbaden, 1849, March 16. He was educated at Halle and Leipsic, was instructor in the gymnasium at Wiesbaden and at Leipsic; and in 1872–7 was assistant at the Russian institute of classical philology at the latter place. In 1877 he was lecturer at the University of Leipsic, and in 1882 became professor of comparative philology there; in 1884 he took

the same position at the University of Freiburg, but returned to Leipsic in 1887 as successor to Curtius. He is one of the chief representatives of the new school of philologists and his researches have done much to revolutionize the study of philology. As joint editor with Curtius of *The Studies in Greek and Latin Grammar*, he wrote an article for this work on *Nasilis Sonans*, in which he defended theories so radical that Curtius after disclaimed them. His conclusions are now generally accepted. His most important work, summarizing his conclusions, is *Outline of the Comparative Grammar of the Indo-Germanic Languages* (translated into English); he also wrote *Morphological Researches in the Indo-Germanic Languages* (with Osthoff); *A Problem of Homeric Textual Criticism* (1870); *Lithuanian Folk Songs and Tales* (1882); *The Present Position of Philology; Greek Grammar;* and *Short Comparative Grammar* (1902).

BRUGSCH, Heinrich Karl, German Egyptologist: b. Berlin 1827, Feb. 18; d. Charlottenburg, 1894, Sept. 9. A work entitled *Scriptura Ægyptiorum Demotica*, published in 1848, gained him the favor of Alexander von Humboldt and Frederick William IV., the latter of whom enabled him to complete his studies by visiting the museums of Paris, London, Turin, and Leyden. In 1853 he made his first visit to Egypt and assisted Mariette in his researches, being appointed on his return in the following year assistant in the Berlin Egyptian Museum. He accompanied the Prussian embassy to Persia in 1860, and four years later became consul at Cairo. Returning in 1868, he was appointed to the chair of Egyptology at Göttingen, but soon resigned in order to take charge of the Cairo School of Egyptology. He was soon raised to the rank of bey, and some time afterward to that of pasha. In 1876 he came to the United States as Egyptian commissioner to the Centennial Exposition at Philadelphia. In 1883 he traveled in Egypt, Syria, Greece, and Italy, with Prince Frederick Charles of Prussia, and in 1885–6 he twice visited Persia, partly on official business. He was again in Egypt in 1891, and in the following year he made a journey to the Libyan desert. Brugsch's chief work is the *Hieroglyphisch-demotisches Wörterbuch* (1867–82). His other writings include *Reiseberichte aus Ägypten* (1855); *Grammaire Démotique* (1855); *Monuments de l'Egypte* (1857); *Geographische Inschriften altägyptischer Denkmaler* (1857–60); *Histoire d'Egypte* (1859); *Recueil des Monuments Egyptiens* (1862–65); *Reise der konialich Preussischer Gesandtschaft nach Persien* (1862–3); *Hieroglyphische Grammatik* (1872); *Geschichte Agyptens unter den Pharaonen* (1877); *Dictionnaire Géographique de l'ancienne Egypte* (1877–80); *Religion und Mythologie der alten Agypter, nach den Denkmalern* (1888); *Thesaurus In-*

scriptionum Ægyptiacarum (1883–91); *Die Ägyptologie* (1890); *Aus dem Morgenlande, Altes und Neues* (1893); etc. His *History of Egypt from the Monuments* has appeared in English. In 1894 his autobiography appeared under the title *Mein Leben und Wandern.*

BRÜHL, HEINRICH, Count VON BRÜHL, Prime-Minister of Augustus III. (Augustus III. King of Poland, and Elector of Saxony): 1700–1763, Oct. 28, b. Weissenfels: In early life he entered as a page into the service of the Duchess of Sachsen-Weissenfels. His winning address and tact gained for him rapid promotion through several offices of state, until, 1747, he became prime-minister to the idle and unpatriotic Augustus III. Never was a ruler more slavishly obeyed by a statesman. Bruhl would follow the prince, as he strolled about smoking, without speaking a word for a whole day; or, when his majesty lazily inquired: 'Bruhl, have you any money for me?' 'Yes, sire,' would be the constant reply; but in order to be able to give this answer as frequently as it was demanded, Bruhl drained the coffers of the state, and burdened the country with debt. He, however, contrived to enrich himself, and to accumulate honors and titles. By Elizabeth of Russia he was invested with the order of St. Andrew, and by Charles VI. of Austria, he was made a count of the empire. He kept 200 servants, paid his body-guard better than Augustus did his, furnished the costliest table, had the finest wardrobe, and in short, maintained the most splendid establishment in the kingdom. 'Of all statesmen,' said Frederick II., 'Bruhl has collected the greatest quantity of fine clothes, watches, laces, boots, shoes and slippers!' The effect of Bruhl's reckless robbery of the national finances to gratify the dissolute Augustus and himself, made itself felt at the outbreak of the Seven Years' War, when the country could furnish only 17,000 men to oppose Frederick of Prussia, who surprised and captured the whole Saxon army in its camp at Pirna. Augustus and Bruhl fled to Warsaw. When peace was concluded they returned to Dresden, where Augustus died 1763, Oct. 5; followed by his worthless parasite, Oct. 28. B.s palace is still one of the principal buildings in Dresden, and his library, 62,000 vols., forms a chief part of the Royal Library, Dresden.

BRUIN, n. *brō'in* [Dan. and Dut. *bruin;* Icel. *brun,* brown—from the color]: the familiar name for a bear of the German nursery fables.

BRUISE, n. *brōz* [F. *briser,* to break—from O.H.G. *bristan;* OF. *bruiser;* Gael. *brisd,* to break; *bruis,* fragments]: a break or crush of the flesh without breaking the skin; an injury on the flesh by its being crushed or struck with a heavy or blunt substance, causing discoloration, blue, red, and yellow, successively; a con-

tusion: V. to crush or hurt by pressure or beating; to pound or reduce to coarse powder, as minerals or grain. BRUIS'ING, imp. BRUISED, pp. *brôzd.* BRUISER, n. *brôz'er*, he who, or that which; a prize-fighter.—SYN. of 'bruise, v.': to squeeze; pound; crush; bray; box.

BRUISE, or CONTUSION: injury inflicted by a blow or sudden pressure, in which the skin is not wounded, and no bone is broken or dislocated. Both terms, and especially the latter, are employed in surgery to include all such injuries in their widest range, from a black eye to a thoroughly crushed mass of muscle. In the slighter forms of this injury, as in ordinary simple bruises, there is no tearing of the textures, the utmost damage done being the rupture of a few small blood-vessels, which occasions the discoloration always observed in these cases. In more severe contusions, the subjacent structures—muscles, connective tissue, vessels, etc.—are more or less ruptured, and in extreme cases are thoroughly crushed, and usually become gangrenous. The quantity of blood extravasated mainly depends upon the size and number of the ruptured blood-vessels, partly also on the nature of the textures of the injured part. Thus, a lax tissue, as that of the eyelids, favors the escape of blood into the surrounding parts. Moreover, the constitution of the patient has some influence, and many persons, especially pallid, fatty, soft-skinned women, though suffering from no apparent disease, are subject to extravasations, and consequently to discolorations, very disproportionate to the injuries that cause them.

The most characteristic signs of a severe contusion are more or less shock, pain, swelling, and discoloration of the surface from effused blood (commonly known as *Ecchymosis*). There is nothing special in the character of the shock, but it is noticeable that it is most severely felt in injuries of special parts—as the testes, the breasts, and the larger joints; such injuries are often followed by remarkable general depression, faintness, loss of muscular power, and nausea. The immediate pain following the blow is succeeded by a feeling of numbness, which, after a varying time, unless the part is killed, gives place to a heavy, aching pain. Swelling rapidly follows, and in lax parts, such as the eyelids, it is often considerable, and may remain for a week or more, but usually subsides in two or three days. The discoloration of the skin consequent on blows is of a more or less purple tint, varying from black to crimson or pink. After a variable time, proportionate to the severity of the injury, the color fades out, passing usually through gradually lightening shades of brownish olive, green, and yellow. The causes of these changes of color are not clearly known; as, however, the changes are not observed in bruises of parts removed from air and light, they are probably due to oxidation

and actinic agency. When a severe bruise tends to a natural cure, and there is no inflammation or sloughing, the effused blood is generally absorbed, the liquid portion rapidly disappearing, while the blood-cells are more slowly removed.

One or two ill consequences following partial recovery, require notice. Thus, in some organs, as the breast, abscess may ensue long after a blow; or a sensitive indurated lump may remain; or (more commonly) there may be long-continued pain, without change of texture; or, lastly, cancer may result.

Blows on superficial bones, as those of the skull, are frequently followed by very painful thickening of the periosteum; and a muscle violently struck may be paralyzed and rapidly waste away: constitutional diseases, such as gout and rheumatism, are well known to localize themselves with special severity in parts that have been seriously bruised.

With regard to treatment, simple and not very severe bruises require little treatment but the rest necessary for the avoidance of pain; but the removal of the swelling and discoloration may be hastened by the application of various local stimulants, which seem to act by accelerating the circulation through the bruised part, and promoting the absorption of the effused fluid. Friar's balsam, compound soap liniment, or poultices made with the roots of black bryony beaten to a pulp, are popular remedies of this class. The tincture of arnica is a favorite application, but caution in its use is necessary as it may excite a severe inflammation.

Pugilists, who are probably better acquainted with ordinary bruises than any other class of men, are in the habit of removing the swelling of the eyelids that often naturally occurs during a prize-fight, to such an extent as to close the eyes, by at once puncturing the eyelid at several points with a lancet; and their favorite remedy for a black-eye or other bruise on the face is a fresh beef-steak applied locally, as a poultice. Bruises of a more severe nature, as when there is much breaking or crushing of the tissues, must, of course, at once be placed in the hands of a surgeon.

BRUIT, n. *brôt* [F. *bruit*, a noise—from *bruire*, to roar: It. *bruito*, a muttering: Gael. *briot*, idle tattle—*lit.*, a muttering noise]: a report; fame; in *med.*, applied to various sounds heard in auscultation in disease of the thorax, or its organs; V. to spread a report; to noise abroad. BRUIT'ING, imp. BRUIT'ED, pp. noised or rumored abroad.

BRUMAIRE *brû-mär'* [Lat. *bruma*, winter]: division of the year in the republican calendar of France. It includes the time from Oct. 22 to Nov. 20. The celebrated 18th B., which witnessed the overthrow of the Directory and the establishment of the sway of Napoleon, corresponds with 1799, Nov. 9 of the Gregorian calendar.

BRUMAL, a. *brō'măl* [F.—from L. *bruma*, winter]: of or relating to winter.

BRUME, n. *brōm* [F.]: mist; fog; vapor.

BRUMIDI, *brō-mē'dē*, CONSTANTINE: 1805–80; b. Rome; son of a Greek father and an Italian mother. At Rome, he took a course in the College of Fine Arts, came to the United States 1852, and began work on church decorations in New York, Philadelphia, and the city of Mexico. In 1854, he went to Washington; and was engaged on frescoes in the national capitol. In 1864, he commenced the allegorical and historical paintings on the domical ceiling of the canopy, with an area of nearly 5,000, sq. ft., 180 ft. above the floor. The central group is in honor of Washington. The original states are represented by 13 female figures arranged in the foreground, whose drapery, decoration, and coloring indicate the products and situation of the states in their geographical order from New Hampshire to Georgia. Around the base is an allegory of the Revolution in six emblematic groups. These represent 1. *The Fall of Tyranny;* 2. *Agriculture;* 3. *Mechanics;* 4. *Commerce;* 5. *Marine;* 6. *Arts and Sciences.*

BRUMMAGEM, a. n. *brŭm'ă-jĕm* [colloquial, but old name of *Birmingham*]: in *familiar slang*, denoting anything sham or fictitious; denoting spurious money, as made at Birmingham.

BRUMMEL, *brum'mĕl*, GEORGE BRYAN (BEAU BRUMMEL). 1778–1840; b. London. He was educated at Oxford, and achieved success in writing Latin verse. Being a model of taste and elegance, and a favorite with the Prince of Wales, he became the arbiter in all questions of fashion and etiquette. As long as his money lasted or the Prince of Wales contributed, he lived in a splendid establishment in London, and associated on equal terms with the nobility. Having squandered his fortune, he became a reckless gambler, and in 1815 fled from his creditors to France, where he died in poverty.

BRUNCK, *brûnk*, RICHARD FRANÇOIS PHILIPPE: 1729, Dec. 30—1803, June 12; b. Strasburg: critic and philologist. He was educated under the Jesuits in Paris but abandoned his studies, and was a military commissary in the Seven Years' War. A professor in Giessen, with whom B. happened to lodge while the army was in winter quarters, revived in him the love of classical studies. Returning to Strasburg he gave all his spare time to Greek, and soon distinguished himself as an able but adventurous critic and emendator. His belief that all inaccuracies in ancient Greek writings were introduced by copyists, often led him astray; but, since the revival of learning, few critics have done more for the progress of Greek literature. His first work, *Analecta Veterum Poëtarum Græcorum* (1772–76), was followed by several editions of Anacreon (1778–86), and editions of Apollonius Rhodius (1780) and Aristophanes (1781–83), *Poëtæ Gnomici* (1784), Virgil (1785), and Sophocles (1786–89). The last of these established a new era in the criticism of the tragic writers. The out

break of the French revolution interrupted B.'s studies. He ardently attached himself to the popular side. During the Reign of Terror, he was imprisoned, but was liberated after the downfall of Robespierre. His means, however, had been so much reduced that he was compelled to sell his valuable library. From this time, 1801, he turned his attention from Greek to Latin literature, and published editions of Plautus and Terence.

BRUNDUSIUM: see BRINDISI.

BRUNE, *brün*, GUILLAUME MARIE ANNE, Marshal of the first French empire: 1763, March 13—1815, Aug. 2; b. Brives-la-Gaillarde. His education brought him early into connection with the men of the Revolution. With Danton he helped to establish the Cordelier's Club. After the conquest of Belgium he was sent as civil commissary to that country, but his warlike aspirations soon induced him to enter the military service. In 1797, he became brigadier under Napoleon in the army of Italy, and distinguished himself at Arcola and Rivoli, where he was made gen. of division and leader of the advance guard. Sent by the directory to Switzerland, 1798, he executed his orders with brilliant success. In 1799, he was appointed to the command of the army of Holland, where he won the repute of being one of the best generals of his age. He vanquished the Anglo-Russians at Bergen, 1799, Sep. 19; and on Oct. 19, forced the Duke of York, commander-in-chief of the combined armies, to a humiliating capitulation at Alkmaar. In 1803, he was named ambassador to the Ottoman Porte, and was received by Selim III. with great distinction. In 1804, he obtained the dignity of marshal, and in 1805 returned to France. Two years afterward B. became gov.gen. of the Hanseatic towns, and was charged with the conquest of Pomerania, but through the unnecessary distrust of Napoleon, he was recalled, and his future services dispensed with. After the fall of the emperor he declared for the Bourbons, but his offers were rejected, and, in consequence, he joined Napoleon after his return from Elba. He was now made a peer, but the battle of Waterloo destroyed his prospects. He again made his submission, but was barbarously assassinated at Avignon, by the populace, who were infuriated against him on account of certain crimes laid to his charge, of which he seems to have been entirely guiltless.

BRUNEHILDE, *brō'nā-hĭl'dā*, or BRUNEHAUT, *brün-hō'*: 534-613: daughter of Athanagild, King of the Visigoths: became queen of Austrasia (568) by her marriage with Sigebert, one of the four sons of Clotaire I. Her sister Galsunda had married Chilperic, King of Neustria, and a brother of Sigebert, who, at the demand of his mistress Fredegonda, abandoned and murdered his queen, and married Fredegonda. B. now determined to avenge the death of her sister, and induced her husband to invade the dominions of his brother Chilperic. While besieging Tournay he was killed and B. was made prisoner. Having married one of the sons of Chilperic, she escaped to Austrasia, deposed

Childebert, who was occupying the throne; and re-established her authority. But she became ambitious and reckless. Having instigated a war between her grandsons, she was finally captured by Clotaire II., son of Fredegonda. After subjecting her to torture and insult for three days, he caused her to be tied to the tail of a wild horse, which being turned loose, dragged her to death. Her body was then burned and the ashes scattered to the winds.

BRUNE ISLAND *brô-nā':* off the s. part of the e. coast of Tasmania, from which it is separated by D'Entrecasteaux Bay. It has a length of 32 m., breadth from 1 to 6 m.; and its e. or outside coast is indented by a bay, which takes its name from the *Adventure,* one of Cook's two vessels during his second voyage.

BRUNEL, *bru-nĕl',* Isambard Kingdom: engineer: 1806, Apr. 9—1859, Sep. 15; b. Portsmouth, Eng.; son of Sir Mark I. B. He was educated at the college of Henri Quatre, Caen, France. He commenced practical engineering 1826, under his father at the Thames Tunnel, and in the progress of that great work had more than once to save his life by swimming. He assisted in his father's experiments for making carbonic acid gas a motive power, and was designer and civil engineer of the *Great Western,* the first steamship built to cross the Atlantic; and of the *Great Britain,* the first ocean screw-steamer. The *Great Eastern,* the largest vessel ever built in the world, was erected under his sole direction. In 1833, B. was appointed chief-engineer to the Great Western railway, Eng., and designed and constructed the whole of the tunnels, bridges, viaducts, and arches on this line, and extension branches. Among other docks at English seaports, in the improvement and construction of which he was engaged, were the Bute docks at Cardiff, and the old North Dock at Sunderland. In 1842, he was employed by government to construct the Hungerford Suspension-bridge across the Thames at Charing Cross, London. In 1850–53, he constructed the works of the Tuscan portion of the Sardinian railway. Made a fellow of the Royal Soc., 1830, he was chosen on the council, 1844. He was also vice-pres. of the Institution of Civil Engineers, and of the Soc. of Arts; a fellow of the Astronomical, Geological, and Geographical Societies, and Chevalier of the Legion of Honor. See his Life (1870).

BRUNEL, Sir Mark Isambard: engineer of the Thames Tunnel: 1769, Apr. 25—1849, Dec. 12; b. Hacqueville, near Rouen, France; son of an agriculturist. He early showed inclination for mechanics, and at school preferred the study of the exact sciences to the classics. In 1786, he became a sailor in the French navy. In the revolutionary period of 1793, having compromised himself by his political opinions, he escaped from Paris to the United States. His career as an engineer began 1794, when he was appointed to survey for the canal which connects Lake Champlain with the Hudson river at Albany. He afterward was an architect in New York. On his return to Europe, 1799, he married the daughter of William Kingdom, Esq., Plymouth,

and settled in England. A plan submitted by him to government for making block-pulleys for ships by machinery was adopted, and he was for many years employed in Portsmouth dockyard. He was successful in the construction of public works—in Woolwich arsenal and Chatham dockyard, etc. His most remarkable undertaking was the Thames Tunnel, beneath the bed of the river at London; begun, 1825, Mar.; opened to the public 1843, Mar. Assisted by his son, Isambard K. B. (q.v.), he for ten years pursued a course of experiments for employing carbonic acid gas as a motive power, but the cost of the machinery prevented its introduction as a substitute for steam. Among the less important of B.s inventions, were machines for making wooden boxes; for ruling paper; for shuffling a pack of cards without using the hands; for the manufacture of nails; and for making seamless shoes for the army—the latter, tried for two years, was abandoned from economical motives. Elected a fellow of the Royal Soc., 1814, he was appointed vice-pres., 1832. He was knighted 1841.

BRUNELLESCHI, *brô-nĕl-lĕs'kē*, Filippo: 1377–1444; b. Florence: one of the greatest Italian architects. He learned first the art of a goldsmith; next, that of a sculptor; and finally applied himself to architecture. He also studied zealously mechanical and mathematical science, and is reckoned the first who established, on a sound basis, the theory of perspective. When still young, Brunelleschi went to Rome, where he acquired a profound knowledge of ancient architecture, the result of which was, that two ideas completely possessed his mind: the one was, to revive the ancient style of architecture; the other was, to make himself master of the mechanical knowledge of the ancient architects. In 1407, he returned to Florence. In 1420, it was proposed to complete the structure of the cathedral of Santa Maria del Fiore, founded 1296, and now lacking only a dome. A great assembly of architects from all quarters was convened to determine how it might be practicable to cover the vast octangular area. While the debate was going on Brunelleschi was earnestly elaborating his own designs; but when he first came forward and proposed his plan, it was so ill received, on account of its supposed absurdity, that Brunelleschi was 'lifted off his legs, anl carried out of the room.' He, however, obstinately persisted in explaining his scheme, and at last succeeded in convincing every one of its feasibility. The work was intrusted to him, and finished, with the exception of the lantern, with which he intended to crown the whole, but was prevented by his death. Brunelleschi's dome, measured diametrically, is the largest in the world, and served as a model to Michael Angelo for that of St. Peter's. Besides this *chef d'œuvre*, Brunelleschi executed several other great

works, such as the churches of San Spirito and San Lorenzo.

BRUNETIERE, FERDINAND: French critic: b. Toulon 1849, July 19; d. Paris 1906, Dec. 9. In 1875, he became editor of the *Revue des Deux Mondes.* In 1886, he was made prof. of French language and literature in the Ecole Normale Superieure. He held a professor's chair also in the Sorbonne and was one of the foremost members of the French Academy. He published about 20 vols., chief of which are his critical studies on the history of French literature *(Études critiques sur l'histoire de la littérature française)*, the latest edition of which appeared 1887. He delivered a course of lectures in Harvard, John Hopkins and Columbia Universities 1897. In criticism his keynote was authority. He commended, not what pleased him but what the reader ought to like. Because of his honesty he was respected, feared, and frequently disliked.

BRUNETTE, n. *brû-nĕt* [F. *brunette*—from *brun;* O.H.G. *brûn*, brown, dusky]: a girl or woman with a dark or brownish complexion; opposite of *blonde.*

BRUNI, *brô'nē*, LEONARDO: 1369–1444, Mar. 9; b. Arezzo, hence styled *Aretino:* one of the most learned men during the epoch of the revival of Greek learning in Italy. He filled several offices at the papal court, and, at a later period, he was appointed state secretary of the republic of Florence.

B. aided in advancing the study of Greek literature mainly by his literal translations into Latin of Aristotle, Demosthenes, Plutarch, and others. Most of his numerous original works are now nearly forgotten.

BRUNION, n. *brŭn'yŭn* [F. *brugnon*, prune]: a nectarine, a novel variety of peach fruit.

BRUNN, *brün:* fortified city of the Austrian empire, cap. of the govt. of Moravia; beautifully situated, partly on the slope of a hill, partly in a pleasant valley, at the confluence of the Schwarzawa and the Zwittawa; lat. 49° 12′ n., long. 16° 37′ e. Behind the city, on an eminence, is the castle of Spielberg, formerly the citadel, now used as a state-prison, and noteworthy as the place in which Silvio Pellico was confined, 1822–30. Among the most interesting buildings of B. are the cathedral of St. Peter; St. James's Church, a Gothic edifice, with a tower 276 ft. in height, and a valuable collection of ancient printed books; the Church of the Minorites; and the Augustine convent. There are also several fine palatial residences belonging to the old nobility. B. is one of the most important manufacturing towns in the Austrian dominions. Its woolens are specially celebrated, and it has manufactures also of cotton, silk, ribbons, yarns, glass, leather, soap, tobacco, anl dye-stuffs. Napoleon made B. his headquar-

ters before the battle of Austerlitz. Pop. (1881) 82,660; (1890) 95,342; (1900) 109,346.

BRUNNEN, *brôn'nen:* village of Switzerland, canton of Schwyz, of which it forms the port, near the mouth of the Muotta, in the Lake of Lucerne. It is beautifully situated at the s.e. bend of the lake, and is celebrated in history as the place where, 1315, Dec., the deputies of the Forest Cantons, who, eight years before, had formed a plan for the liberation of their country from the Austrian yoke, laid the basis of the Helvetic republic.

BRUNNER, *brûn'nėr:* or BRUNN, *brûn,* JOHANN CONRAD: 1653–1727; b. Diessenhofen: Swiss anatomist and physician. After receiving the doctor's degree at Strasburg, he visited Paris, London, and Amsterdam, and formed the acquaintance of the most distinguished men of the time. He became prof. at Heidelberg, 1687, and acquired such reputation that he was consulted by the kings of Prussia, England, and Denmark. He published a number of important medical works. He died at Mannheim.

BRUNNOW, *brô'nof,* ERNEST PHILIP Count VON: 1797–1875, Apr. 12; b. Dresden; Russian diplomatist. He studied at the Univ. of Leipsic. At the time of the congress of Aix-la-Chapelle, he entered the Russian service, and the ministers Nesselrode and Capo d'Istrias recognized at once his fitness for a diplomatic career. Among other posts he attended the congresses of Troppau and Laybach, acted one year as sec. to the embassy in London, went to the congress of Verona, and then occupied for a time a high office in St. Petersburg. He was present, in a civil capacity, in the campaigns of 1828–9 against the Turks. In the autumn of 1839, he was sent on a special mission to London, to take advantage of the unpleasant feeling between Great Britain and France for drawing the cabinets of St. Petersburg and London closer together, and in the following spring was accredited as permanent ambassador. In this capacity he acquired distinction as a diplomatist. Retiring from London on the outbreak of the war, 1854, he represented Russia in Frankfort, and with Count Orloff, was sent to the conference of Paris, 1856, Feb. Immediately after the treaty of peace had been concluded, he was sent on a special mission to London, to re-establish friendly relations between the courts of St. Petersburg and St. James. He was afterward appointed to the court of Prussia; but in 1858 he returned to his old place in London, where he was a great favorite. He represented Russia at the conferences in London, 1864 and 1871. In recognition of his services, he was raised by the emperor of Russia to the rank of count, 1871, Apr. In 1874, he retired to Darmstadt, where he died.

BRUNO, *brô'no*, GIORDANO: b. Nola, in the kingdom of Naples, about the middle of the 16th c.; died at the stake 1600, Feb. 17: precursor of the school of modern Pantheistic philosophers. He entered, at an early age, the order of the Dominicans, but soon began to express doubts in regard to the doctrines of Transubstantiation and of the Immaculate Conception, in consequence of which he was forced to flee from his convent. Henceforth his life was unsettled. In 1580 (?) he went to Geneva, where he spent two years, but having excited the suspicion and dislike of the strict Calvinists of that city by his general skepticism, he judged it prudent to betake himself to Paris, where he delivered prelections on the 'Great Art' (Logic) of Raymond Lully. His disputes with the bigoted Aristotelians of the Univ. of Paris compelled him to leave France. He passed over into England, where he resided for two years in comparative quiet, enjoying the friendship of Sir Philip Sidney and the protection of the French ambassador, Michel de Châteauneuf de la Mauvissière. Here he composed his most important works, but having incurred the displeasure of the clergy by his vehement denunciation of the Aristotelian philosophy, and other grave heresies, he returned to Paris, 1585. In 1586 he went to the Univ. of Marburg, where he matriculated; and to Wittenberg, where he became prof.; but being asked to join the Lutheran communion, he refused. On his departure from the city he pronounced an impassioned panegyric on Luther. After spending some time in Prague, Brunswick, Helmstadt, and Frankfort-on-the-Main, he resolved to go back to Italy. He fixed his residence at Padua; but after a stay of two years he went to Venice, where he was arrested by the officers of the Inquisition, and conveyed to Rome, 1598. He was now subjected for two years to persecution, in the vain hope that he would recant; but when all the endeavors of his enemies proved ineffectual, he was brought to the stake, and burned as an obstinate heretic.

Bruno's writings, of which the most valuable were in Italian, show throughout a strong, courageous, excitable soul, susceptible of deep enthusiasm, but vainly laboring to attain perspicacity. The *Cena delle Ceneri*, or Evening Conversations on Ash-Wednesday, is an apology for the Copernican astronomy; the *Spaccio della Bestia Trionfante*, or Expulsion of the Triumphant Beast (Par. 1584), is a satirical but somewhat heavy allegory in the style of the times, His greatest works are metaphysical, such as the *Della Causa Principio ed Uno* (On the One Sole Cause of Things), and the *Del Infinito Universo e Mondi* (On the Infinity of the Universe and of Worlds). The doctrine enunciated in these is Pantheistic. Bruno held that the infinite soul of God did not merely inhabit or pervade the universe, but that the universe was simply a manifestation of Him, therefore itself divine. God was therefore, in the

most literal and physical sense, all *in* all. B.'s philosophy, in later times, was quite unappreciated, and even neglected, until Jacobi drew public attention to it in his *Letters on the doctrine of Spinoza.* Spinoza was distinctly indebted to Bruno. His influence is discernible also in the Pantheistic speculation of modern Germany. Bruno's Italian works were published by Wagner, 1830: the Latin ones by Florentino, 1883. See Lives by Bartholomès (Par. 1846); Clemens (Bonn, 1847); Berti (2 vols. Flor. 1868–80); Sigwart (Tüb, 1880); and Brunnhofer (Leip. 1883).

BRUNO, SAINT: 1051–1101; b. Cologne: founder of the Carthusian order of monks. He received his earliest education in the school attached to the Collegiate Church of St. Cunibert. Subsequently, he studied at Rheims, where he distinguished himself so greatly, that Bp. Gervasius appointed him director of all the schools in his diocese. Bruno soon began to be troubled by the wickedness of his time, and, anxious to escape from the general pollution, he took refuge, with six pious friends, is a desert place near Chartreuse, in the diocese of Grenoble. Here, 1086, he founded one of the most austere of all the monkish orders, which received its name from the locality whence it had sprung: see CARTHUSIANS. Bruno and his companions had each a separate cell, in which they practiced the severities of the rule of St. Benedict, keeping silence during six days of the week, and only seeing one another on Sundays. Pope Urban II., one of Bruno's most eminent scholars, summoned the saint to Rome, 1089. Bruno obeyed the call reluctantly, and steadily refused all offers of preferment. In 1094, he established a second Carthusian monastery, called La Torre, in a solitary district of Calabria, where he died. He was not canonized till 1628. Bruno himself left no written regulations for his followers, but such regulations made their appearance in a complete form 1581, and were enjoined on all Carthusians by Innocent IX.

BRUNO, THE GREAT, Archbishop of Cologne, and Duke of Lorraine: 928–965, Oct. 11; third son of Henry the Fowler, and the brother of Otto I., Emperor of Germany. Baldrich, Bp. of Utrecht, and afterward Israel Scotigena, and others, were his tutors. His surprising knowledge, sagacity, and eloquence secured immense influence over the bishops and clergy, while his liberality, meekness, and great earnestness of heart, won the affection and reverence of the laity. Sommoned by Otto to the imperial palace, he quickly rose to great influence among the chroniclers, poets, and philosophers of the court. At a later period, he was appointed Abp. of Cologne, and lord high chancellor of the empire. He accompanied Otto to Italy 951, and honorably distinguished himself by his fidelity to his brother, when Otto's own son, Conrad, and others of his

kindred rebelled against him. As a reward, the emperor appointed him Duke of Lorraine. Bruno died at Rheims. He wrote a commentary on the Pentateuch, and several lives of saints.

BRUNONIAN, a. *brô-nō′nĭ-an* [named after Dr. John *Brown*, 1735–1788]: pertaining to or emanating from Brown; n., an alumnus of Brown University at Providence, R. I.

BRUNSWICK: town, port of entry, cap. of Glynn co., Ga., on St. Simon's Sound, 8 m. from the ocean, 80 m. s.s.w. of Savannah. It has a safe and commodious harbor with a light-house at the entrance; and two leading railroads, the Plant System and the Southern railroad, connect it with all important trading centres of the state, and also all important places further distant. A line of packets and a weekly steamer connects it with New York, and a daily steamer with Fernandina, Fla. The Savannah and Jacksonville steamers also stop here. Brunswick has various manufactures; and exports much pine lumber and cotton. Pop. (1910) 10,182.

BRUNSWICK: town in Cumberland co., Me., on the w. bank of the Androscoggin river, at the head of navigation, 9 m. w. of Bath, 29 m. n.e. of Portland; at the junction of the Maine Central, the Bath, and the Androscoggin railroads. A bridge crosses the river to Topsham. The river affords abundant water-power. It is the seat of Bowdoin College (q.v.) and of its branch, the Maine Medical College. It has several banks, a weekly newspaper, a number of churches, and various manufactures. Lumbering and ship-building are the chief industries. Pop. (1910) 6,621.

BRUNSWICK: capital of the duchy of Brunswick; on the Oker, in a level and fertile district; lat. 52° 46′ n., long. 10° 4′ e. Brunswick, which is a very old place, is supposed to have been first walled about the 9th c., by Bruno, Duke of Ostfalen. But Henry the Lion, 12th c., so greatly beautified and extended the city that he may also be said to be its founder. In the 13th c., Brunswick became a member of the Hanse League, and soon attained considerable commercial prosperity, but it declined with the decay of the League. The town is most irregularly built, with narrow and crooked streets, but has good causeways and abundant supply of water. The cathedral—in which are some interesting relics brought by Henry the Lion from the Holy Land—with the churches of St. Martin, St. Catharine, and St. Andrew, with its steeple 316 ft. high, are among the principal buildings. In the museum are some interesting antiquities and works of art by Jan Steens, Albert Dürer, Holbein, Rembrandt, Raphael, Guido, Ruysdael, Michael Angelo, and Benvenuto Cellini. The industry of Brunswick consists chiefly in manufactures of woolen and linen, chickory, beet-sugar, tobacco, *papier-mâché*, lackered wares, etc. Its great annual fair, founded

1498, is important. The old fortifications of Brunswick have been demolished, and their site converted into pleasant promenades. A fine avenue of linden-trees leads to the duke's palace, an imposing edifice, built 1869. Pop. (1900) 128,226.

BRUNSWICK, *brŭnz'wik*, DUCHY OF, (Ger. *Braunschweig*): a state of n. Germany, consisting of three larger and five smaller distinct parts; mostly within lat. 51° 38′—52° 28′ n., and long. 9° 23′—11° 30′ e.; about 1,425 sq. m. For administrative purposes, Brunswick is divided into six circles—viz., Brunswick, Wolfenbüttel, Helmstedt, Gandersheim, Holzminden, and Blankenburg. Of the three larger parts, the principal one, forming the circle of Wolfenbüttel, and including the capital, lies between Prussia and Hanover; the second, extending e. and w. from Prussia to the Weser, divides Hanover into two parts; and the third, forming the circle of Blankenburg, lies to the s.e. between Hanover, Anhalt, and Prussia. The smaller parts are the isolated bailiwicks of Calvörde in the e., Thedinghausen in the w. (not far from Bremen), and some very small demesnes in the Hanoverian boundaries. Brunswick belongs mostly to the basin of the Weser, which river serves as a boundary on the w. The surface is mostly mountainous, particularly in the s. portions of the country, but Brunswick has nevertheless level tracts of considerable extent. The rivers, with the exception of the Weser, are comparatively unimportant, though advantage is taken of one or two for the transport of timber. The climate in the lowlands resembles the general climate of n. Germany; but in the Harz district it is so much colder, that harvest is generally a month later than in the plains.

The mines and quarries of Brunswick produce marble, alabaster, limestone, gypsum, alum, iron, copper, lead, sulphur, and salt in large quantities, with some gold and silver. Agriculture, carried on with intelligence and energy, constitutes the chief wealth of the duchy. The products include, beside the ordinary cereals, large quantities of leguminous plants, potatoes, tobacco, and hops. The pasture land is extensive and great attention is paid to the rearing of cattle, and especially to the breeding of sheep, wool being an important article of commerce. A large number of persons are employed in the cutting and preparation of timber. The chief manufactures of B. are linen, stockings, woolen cloth, metals, porcelain, paper, sugar, glass, beer, etc.

The annual revenue of Brunswick is about $3,700,000, and the expenditure $3,600,000. The civil list of the duke is not comprised in the budget, being paid out of the revenues of the state domains and other funds—about $250,000 a year. The Duke of Brunswick has also very large private estates, and is one of the

wealthiest of German sovereigns. At the death of the childless Duke Wilhelm, 1884, the succession passed to the Duke of Cumberland, son of George V., dethroned King of Hanover. As the heir declined to recognize the new constitution of the German empire, the imperial government declined to allow the succession to take place, and an interregnum occurred.

Brunswick was included, as a part of Saxony, under the empire of Charlemagne. In 1235, B., with Lüneburg, was made a duchy under Otto, who died, 1252, and was succeeded, 1267, by his son, Albrecht, founder of the older line of Wolfenbüttel. John, another son of Otto, was the founder of the older Lüneburg line, which became extinct with William of Lüneburg 1369. In 1569, Henry, who styled himself Duke of Brunswick-Lüneburg-Dannenberg, founded the new House of Brunswick-Wolfenbüttel; and his brother William founded the new line of Brunswick-Lüneburg, which, 1815, became the kingdom of Hanover: see HANOVER.

The government is a limited monarchy, the duke's power being restricted by the legislature, which is partly hereditary and partly elective. The inhabitants are mostly Saxons, and, with the exceptions of about 3,000 Reformed, 15,000 Rom. Catholics, and 1,500 Jews, all adhere to the Lutheran Church. The people in the rural districts speak a very broad Low-German dialect; but good High-German is spoken by the educated classes. Pop. (1900) 464,333.

BRUNSWICK, NEW: see NEW BRUNSWICK.

BRUNSWICK BAY: on the n.w. coast of Australia: long. 125° e., and about lat. 15° s. It receives Prince Regent river.

BRUNSWICK BLACK: varnish for coarsely-finished iron grates, fenders, etc. It is compounded mainly of lampblack and turpentine, and when applied with a brush, quickly dries, and leaves a shining, jet-black surface.

BRUNSWICK GREEN: pigment used in the arts, and consisting of the hydrated chloride and oxide of copper ($CuCl,3CuO,4HO$). It may be prepared (1) by acting upon metallic copper with common salt and diluted sulphuric acid, (2) by acting upon metallic copper with moistened salammoniac, or (3) by mixing sulphate of copper and common salt into a paste with water. It is found native at Atacama, in Peru, in the form of a green sand, hence the name Atacamite (q.v.).

BRUNT, n. *brŭnt* [OE. *brunt*, a blow: Scot. *brunt*, burned: Icel. *bruna*, to advance with the speed of fire—from *bruni*, burning, heat; F. *broncher*, to strike the foot against]: the first shock of an onset; the greatest fury or heat of the battle; the force of a blow.

BRUNTON, MARY (BALFOUR), Scotch novelist: b. Burra Island, in the Orkneys, 1778; d. 1818. In her

20th year she married Dr. Alexander Brunton, minister at Bolton, near Haddington; afterward at Edinburgh. She wrote *Discipline* and *Self-Control*, two novels which met with favor. At her death she left *Emmeline*, a tale, and other pieces, which were published by Dr. Brunton, with a biographical sketch.

BRUSA, or BURSA: see BROUSSA.

BRUSH, n. *brŭsh* [F. *brosse*, in *OF.*, signifying heather, scrub: mid. L. *bruscĭă*, brushwood (see BRUSH 2)]: land thickly covered, chiefly with low-growing bushes; copse; thicket. BRUSH'WOOD, n. a lot of small trees or bushes growing closely together; a coppice or thicket; the lopped branches of trees that have been cut down.

BRUSH, n. *brŭsh* [Ger. and Sw. *borste*, a bristle, a brush: F. *brosse*, a bush, a head-brush—from mid. L. *bruscĭă*, thorn-bush, heather: It. *brusca*, heath for brushes: Icel. *bruskr*, a tuft of grass—*lit.*, a bunch of heather]: an article made of hair, bristle, etc., set in wood, for cleaning, as dust from clothes, or for painting; a skirmish; a slight encounter; the tail of a fox: V. to rub or sweep as with a brush; to touch or strike lightly. BRUSH'ING, imp. BRUSHED, pp. *brŭsht*. BRUSH'ER, n. one who. BRUSH'Y, a. *-ĭ*, rough; shaggy. BRUSH'INESS, n. shagginess. BRUSH-WHEELS, wheels without teeth, which move others by friction. BRUSH'WOOD, n. a low, scrubby thicket; cut branches and bushes. BRUSHED BY ME, nearly or just touched me as he passed. TO BRUSH UP, to revive or restore. *Note.*—Both preceding entries are closely connected in meanings, and are identical in etymologies.

BRUSH, CHARLES FRANCIS, American scientist: b. Euclid, Ohio, 1849, March 17. He graduated at the University of Michigan in 1869. He invented the modern arc system of electric lighting and founded the Brush Electric Company. He was decorated by the French Government in 1881 for his achievements in electrical science. In 1891 he won a long contest in the Federal courts over the rights to the manufacture and sale of storage batteries; and in 1900 he was awarded the Rumford medal by the American Academy of Arts and Sciences.

BRUSH, EDWARD N., American physician; b. Glenwood, Erie County, N. Y., 1852, April, 23. He was educated at the University of Buffalo, edited the *Buffalo Medical Journal* (1874–89), and was assistant in the State Lunatic Asylum at Utica, 1878–84, and in the Pennsylvania Hospital for the Insane at Philadelphia, 1884–91. In the year last named he became physician-in-chief of the Shepard and Enoch Pratt Hospital, Baltimore. He has written much upon the subject of insanity and was associate editor of the *American Journal of Insanity* 1878–84, and also from 1897.

BRUSH, George De Forest, American artist: b. Shelbyville, Tenn., 1855, Sept. 28. He studied under Gérôme in Paris and first attracted attention by his pictures of Indian life. His later work is almost entirely figure composition. He exhibited 'The Artist,' and 'Mother and Child,' at the Paris Exhibition of 1900, and received its gold medal. He also received gold medals at the Pan-American Exposition 1901 and the Louisiana Purchase Exposition 1904. He is a member of the Society of American Artists and an associate of the National Academy of Design.

BRUSH, George Jarvis, American mineralogist: b. Brooklyn, N. Y., 1831, Dec. 15. He received a public school education and graduated at Yale, where he studied science in 1852. He subsequently studied in Germany. Since 1855 he has held professorships at Yale—that of metallurgy down to 1864, and that of mineralogy since that date. He has been a leading official of the Sheffield Scientific School since 1864. His writings on mineralogy are authoritative.

BRUSHES, Dynamo; Motor. The conductors which press against and make electrical contact with the moving contacts—such as sliding rings or commutators—of dynamos or motors. They serve to connect the electric circuit with the moving (armature) part of dynamos and motors. Owing to an old belief that, electricity in travelling from one conductor to another in contact therewith, would do so more freely if the contact were made up of a number of points, the original brushes were made of a number of copper wires laid and fastened together to form a brush, the ends of which bore against the revolving commutator; hence the name. At present, nearly all brushes are made of carbon blocks clamped in brass holders. See Electrical Machines.

BRUSH TURKEY, or Megapode: see Jungle Fowl, of Australia.

BRUSK, or Brusque, a. *brûsk* [F. *brusque*, sharp, short,—from It. *brusco*, harsh]: rude: rough or blunt in manners. Brusque'ness, a blunt, rough manner. Brusquerie, n. *brûs'kĭ-rĭ* or *brûsk'rĭ*. Brusqueries, plu. *brûs'kĭ-rĭz* [F.]: bluntness; abruptness; gruffness; roughness. Brusquely, ad. *brûsk'lĭ*, in a rough and blunt manner.

BRUSSELS, *brus'sĕls* (Fr. *Bruxelles*): capital of Belgium; on the small river Senne, tributary of the Dyle; lat. 50° 51′ n., long. 4° 21′ e. It communicates with Antwerp and the Baltic sea, by means of the Scheldt canal, and railways connect it with Germany, France, and Holland, as well as with all principal towns of Belgium. The city is built partly on the side of a hill, partly on a fertile plain; and though some of the streets are so steep that they can be ascended only by

means of stairs, Brussels, on the whole, may be pronounced one of the finest cities in Europe. The upper town, on the side of the hill, is the newest and most fashionable, and is the residence chiefly of the great and wealthy. The king's palace, public offices, chief hotels, and mansions of foreign ministers are here. It is also much more healthful than the lower town, which, stretching along the canal and the Senne, is greatly subject to fogs. But the old town, with its numerous handsome old buildings, formerly belonging to the Brabant nobility, now occupied by merchants and traders, has a fine picturesque appearance, while some of its public edifices are unrivalled as specimens of Gothic architecture. This part has also several noble churches, but it is now wholly given over to trade. French is spoken in the upper part of Brussels; but in the lower Flemish is prevalent, and in one quarter the Walloon dialect is spoken. The English language, owing to the large number of English who reside in Brussels for economy, also is very common. The walls which formerly surrounded Brussels have been removed, and their place in now occupied by pleasant boulevards, shaded by alleys of trees, extending several miles. The *Allée Verte*— a double avenue along the Scheldt canal— forms a splendid promenade, and leads toward the palace of *Laeken*, the surburban residence of the royal family, three m. n. of the city. Beside the fine park in the upper town, covering an area of some 17 acres, ornamented with fountains and statues, and surrounded by the king's palace and other palaces and buildings (the chamber of representatives here was destroyed by fire 1883), Brussels has several other squares or places, among which the most noteworthy are: the *Place Royale*, with its colossal monument of Godfrey of Bouillon; the *Grand Place*, in which is the Hôtel de Ville, a splendid Gothic structure, erected in the beginning of the 15th c., with a pyramidal tower 364 ft. high, surmounted by a statue of St. Michael, the patron saint of B., and where, in 1568, the patriot counts, Egmont and Horn, were beheaded by order of the Duke of Alba; and the *Place des Martyrs*, where a memorial has been erected to those who fell here in the revolution of 1830. Among the churches of Brussels the largest and finest is the cathedral of St. Gudule, which dates from the 12th c., in the pointed Gothic style, with two towers of more modern date, rising on each side to a height of 264 ft., many richly painted windows, a pulpit considered the masterpiece of Verbruggen, and monuments of the dukes of Brabrant and other distinguished persons. In the *Palais des Beaux Arts* is the picture-gallery, containing the finest specimens of the Flemish school of painting; the public library, with its 234,000 vols., and its 20,000 MSS., collected by the dukes of Burgundy—MSS. interesting and valuable not only for their contents, but for the beautiful miniature paint-

ings with which the scholars of Van Eyck adorned them. The observatory is well equipped. The new *Palais de Justice* is one of the most magnificent buildings in Europe. The university, founded 1834, has four faculties—law, medicine, mathematical, and physical sciences, and belles-lettres, and a special school of pharmacy attached. Brussels has also numerous charitable and benevolent institutions; and is the seat of the provincial government of S. Brabant, as well as of the general government of the kingdom. Brussels is one of the chief centres of the industry of the country. Its lace is particularly famous. Of the esteemed carpets which pass under the name of Brussels carpets, only a few are manufactured here, most of those of Belgic make being produced at Tournai. It has manufactures also of damask, linen, ribbons, paper, jewelry, hats, soap, porcelain, mathematical and musical instruments, etc. Carriage-building is an important industry. Printing and lithographic establishments are numerous; and about a dozen newspapers, of which the *Indépendence Belge* has a European reputation, are published daily.

As early as the 8th c., Brussels (*Bruchsella*), then probably a villa of the Frank kings, is mentioned in old chronicles, and that a church existed here in 966 is proved by a deed of the Emperor Otho I. Under Charles V., Brussels was made the court residence in the Netherlands, and became afterward, under Philip II., the chief arena of the Revolution, and of the atrocities committed by the Duke of Alba and the Inquisition. Brussels suffered greatly in the war of Spain against Louis XIV.—in whose reign it was bombarded by Marshal Villeroi and upward of 4,000 buildings destroyed—and in that of Austria against Louis XV.; but still more from the continual prevalence of party animosities caused by the policy of Austria. Under the mild rule of Maria Theresa, Brussels flourished greatly, and in this time many of its best institutions and public buildings were founded. In 1789 occurred the Brabant revolution under Joseph II.; and scarcely had Austrian rule been re-established, after a brief independence, when Brussels fell into the hands of the French, 1792. After other changes of fortune, Brussels, with the other parts of Belgium, was incorporated with the kingdom of the Netherlands 1815, and so remained until the revolution of 1830, by which it became cap. of the independent kingdom of Belgium. Pop. with suburbs (1900) 561,782.

BRUSSELS CARPETS: very handsome and durable carpets, originally made at Brussels, but now chiefly at Kidderminster, England (see CARPETS). BRUSSELS LACE, exquisite and costly fabric made at Brussels.

BRUSSELS SPROUTS, one of the cultivated varieties of *Brassica oleracea* (see BRASSICA: CABBAGE), distin-

guished by producing, in the axils of the leaves, little clusters of leaves which close together and form miniature cabbages. These are used, like other greens of this species, for the table, and are very delicate in fibre and flavor. The plant is cultivated much in the same way as cabbage or kale, requiring, however, less space than most of the varieties. It may be planted in shady situations, or between the rows of crops, such as pease, beans, scarlet-runners, etc., which are to be removed from the ground in autumn. The sprouts are fit for use chiefly in winter and spring. The stem sometimes attains a height of four ft., and the head resembles a small imperfectly bolled savoy, but there is a subvariety with shorter stems, perferable for many situations. In some places it is customary to remove the head early in winter, in order to promote the development of the lateral shoots in spring; but if the head is allowed to remain, the plant becomes taller, and new shoots are formed as the lower ones are removed. The seed is sown in February or March. For cultivation in Britain, where this vegetable is said to degenerate, seed is generally imported from Belgium. Its use has of late rapidly extended, and none of the many varieties of the species to which it belongs is better worth cultivation.

BRUTE, n. *brôt* [L. *brūtus;* It. *bruto*, stupid, irrational: F. *brut*, raw, rough]: a beast; any animal except man; a savage unfeeling man or woman: ADJ. irrational; rough; uncivilized. BRUTA, n. *brô'tă*, a name often used to designate the mammalian ord. *Edentāta.* BRU'TAL, a. *-tăl*, pertaining to a brute; cruel; unfeeling. BRU'TALLY, ad. *-lĭ.* BRUTAL'ITY, n. *-tăl'ĭ-tĭ*, inhumanity; savageness. BRU'TALIZE, v. *-līz*, to make brutal or inhuman; to make like a beast. BRU'TALIZING, imp. BRU'TALIZED, pp. *-līzed.* BRU'TIFY, v. *-tĭfī*, to reduce to the state of a brute. BRU'TIFYING, imp. BRU'TIFIED, pp. *-fīd:* ADJ. reduced to the condition of a brute. BRU'TISH, a. *-tĭsh*, like a brute or beast; ferocious. BRU'TISHLY, ad. *-lĭ.* BRU'TISHNESS, n. the quality of being brutish; savageness.—SYN. of 'brutish': brutal; barbarous; inhuman; cruel; savage; ferocious; unfeeling; gross; carnal; bestial; sensual; ignorant; insensible; stupid.

BRUT'TIUM: ancient province of s. Italy, occupying the long peninsula which forms the present Calabria. It was bounded on the n. by Lucania, and on the s. by the Strait of Messina. That country, bearing large forests of firs, traversed by the Apennines, and watered by the Laus and the Crathis (now Crati), produced wine, olives, and other fruits in abundance. Its chief cities were Cosentia, Rhegium, and Mamertum, whence came the Mamertines. The Bruttians (*Brutti*) gained the ascendency in the peninsula about the middle of B.C. 4th c. First subjugated by the Lucanians, they threw off that

yoke; afterward they were conquered by the Romans, who divided them into *Transmontani* and *Cismontani*, according as they lived on this or the farther side of the Apennines, with respect to Rome. Having joined Hannibal when he invaded Italy, they were reduced to slavery by the Romans, who employed them specially as messengers between Rome and the provincial governors.

BRUTUS, *brô'tus*, Lucius Junius: in the legendary history of early Rome, the hero who overturned the monarchical, and established the republican, form of government. The legend runs that he was the son of a rich Roman. On his father's death, Tarquin the Proud took possession of the property, and put an elder brother to death, and B. himself only escaped the same fate by feigning idiocy (hence the name *Brutus*, stupid). The oracle of Delphi foretold that he should govern in Rome. Remembering his own wrongs, and gifted with the strength and wisdom of one who was fulfilling the decrees of fate, Brutus, when the foul rape committed by one of the royal family upon Lucretia had shocked the people, convoked them, placed himself at their head, and drove the kings from Rome. He is said to have been then elected one of the two first consuls (B.C. 509). That his character as a stern old Roman hero might be complete, the legend adds that he sacrificed to the new republic his own sons, detected in a conspiracy to restore the monarchy; and that at last he fell in mortal combat repelling an attack led on by one of the sons of Tarquin. Little more, however, is established on sufficient historical evidence with regard to Brutus, than that there existed a person of that name who held high office in Rome at a very early period.

BRUTUS, Marcus Junius: B.C. 58–42: Roman conspirator. He appears to have spent the early years of manhood in exclusive devotion to literary pursuits, and not to have taken part in the political dissensions agitating Rome till he had attained mature age. When the civil war broke out between Pompey and Cæsar, he sided with the former; but after the battle of Pharsalia, made his submission to Cæsar, and, in the following year, was appointed gov. of Cisalpine Gaul. On returning to Rome, he divorced his wife, in order to marry Portia, the daughter of Cato, of whose principles in politics he professed to be a disciple. The influence of Cassius prevailed upon him to join the conspiracy which ended in the murder of Cæsar. The efforts of Brutus to retain popular favor afterward not availing to counteract the eloquence of Antony, he was forced to leave first Rome, and then Italy. The remainder of his life was spent partly in Athens, partly in Asia Minor, partly as the leader of a marauding force which maintained itself by plundering the inhabitants of the e. shores of the Adriatic. Defeated by Antony and Oc-

tavianus (Augustus) at Philippi, he ended his life by falling upon his sword.

BRUYÉRE, Jean de la: see Labruyère.

BRUYS, Peter de: see Henricians.

BRYAN, Mary Edwards, American author: b. Jefferson co., Florida, 1844. She began writing at an early age, and before the war was a regular contributor to the *Southern Field and Fireside*, and other journals. Her published books are: *Manch* (1879); *Wild Work* (1881), a story of Louisiana reconstruction; *The Bayou Bride; Kildee* (1886); *Uncle Ned's White Child; Ruth, an Outcast; His Legal Wife; The Girl He Bought; My Own Sin; His Wife's Friend;* etc.

BRYAN, William Jennings: b. Salem, Marion co., Ill., 1860, Mar. 19, the fourth of nine children. His early years were spent on a farm. He graduated from Illinois College in 1881 with high honors, and from Union Law College at Chicago in 1883. He began practice at Jacksonville, Ill., his college town. The following year he was married to Mary E. Baird, of Perry, Ill. His wife also was trained as a lawyer, and has been his constant adviser and helper in his political career. In 1887, he removed to Lincoln, Neb., where he became a member of the law firm of Talbot & Bryan. In 1888, May, he was present as a delegate at the dem. state convention at Omaha. During a lull in the proceedings he was prevailed on to make a speech in which he presented anti-protection views in a manner so forcible and fluent as to win the applause of the convention and to give him standing as a political orator. The following year he declined the democratic nomination for lieut. gov. of Neb., but was an active worker during the campaign. In 1890, he received the democratic nomination for congress. He worked energetically in the face of probable defeat by making a campaign against the McKinley tariff, and was elected by about 6,700 majority. His first term in congress was made notable by a speech on free wool delivered 1892, Mar. 12. In 1892, he ran for a second term. Omaha had been taken out of his district, and for this and other reasons his majority was reduced to 140. It was during this term that he developed a more ardent advocacy of free-silver coinage, supporting Richard P. Bland and antagonizing the Cleveland administration. He refused a renomination in 1894, and became editor of the Omaha *World-Herald* for a brief period. His crowning honors came in 1896, when he received the nomination of the democratic party in Chicago for the presidency of the United States, after an impassioned speech in which he declared for the free coinage of silver and told those who advocated the gold standard, 'You shall not crucify mankind upon a cross of gold.' He was defeated by a plurality of nearly 600,000 votes. In 1900 both he and Pres. McKinley were again nominated by their respective parties, and

Bryan was again defeated, on a platform favoring free silver and opposing trusts and imperialism. Soon after the election he established *The Commoner*, a political weekly. He wrote *The First Battle: a Story of the Campaign of 1896* (1896), which contains some of his speeches and a biographical sketch by his wife; besides he published numerous articles in periodicals. In 1906 he made a tour of the world and was received everywhere with special honors as a distinguished American. He returned home in Sept., and set out immediately on an extensive tour of the United States, speaking in most of the large cities, where he was received with much enthusiasm.

BRYAN, William Smith, author and journalist: b. 1846, Jan. 8, in St. Charles co., Mo. In his 19th year he went to Kansas, where for a short time he edited a newspaper owned by an elder brother, and afterward taught school a few months. Returning to Missouri in 1866, he established a small weekly paper at Wentzville, in St. Charles co., but soon removed it to the city of St. Charles, where it became one of the leading journals of the State. During the campaign of 1872 he inaugurated a war on the ring rule which resulted in the defeat of the rings, and he soon afterward removed to St. Louis and engaged in the book publishing business. The business prospered but the failure of several large concerns which handled the books of the house extensively brought on financial difficulties, and Bryan, surrendering his interests to the creditors, engaged in literary pursuits. His principal publications are: *Pioneer Families of Missouri*, *Footprints of the World's History* and *Our Islands and Their People*, in addition to which he wrote several important historical works for other authors, which were published under their names.

BRYANT, Edwin Eustace, American lawyer and author: b. Milton, Vt., 1835, Jan. 10; d. Toronto, Can., 1903; educated at the New Hampton Institute; removed to Wisconsin 1858. He served in the Civil War and from 1868–72 was private and executive secretary to the governor of Wisconsin. In 1878 he was elected to the legislature of the State; in 1882 was adjutant-general of Wisconsin, and from 1885–89, assistant United States attorney-general for the post-office. He was the author of several well-known law books.

BRYANT, Henry Grier, American explorer and geographer: b. Allegheny City, Pa., 1859, Nov. 7. He graduated at Princeton, 1883, and from the law department of the University of Pennsylvania, 1886. He has contributed literary articles to various magazines and encyclopædias. In 1891 he organized and conducted an exploring expedition to the Grand Falls of Labrador, was second in command of the Peary Relief Expedition in 1892, and in 1897 led an exploring expedition to the

Mount Saint Elias region of Alaska. In 1895 and 1897 he was a delegate to international geographical congresses in London and Berlin.

BRYANT, Jacob, English philologist and antiquary: b. Plymouth, 1715; d. 1804. He studied at Eton and King's College, Cambridge, became afterward tutor of the sons of the famous Duke of Marlborough, the eldest of whom he also accompanied to the Continent as his secretary. After his return he received, by the influence of his patron, a lucrative post in the ordnance, which gave him leisure for his researches into Biblical, Roman, and Grecian antiquities. His most important work is the *New System of Ancient Mythology* (1774–6). He was engaged in a famous dispute on the veracity of Homer and the existence of Troy, in which he endeavored to show that there never was such a city as Troy, and that the whole expedition of the Greeks was a mere fiction of Homer. The object of one of his earlier treatises, which appeared in 1767, is to show that the island Melita, on which Saint Paul was wrecked, was not Malta, but situated in the Adriatic. He endeavored to illustrate the Scriptures by explanations drawn from Josephus, from Philo the Jew, and from Justin Martyr; but in this, as in all his writings, his learning and his ingenuity are misled by his love of controversy and paradox.

BRYANT, John Howard, American poet: b. Cummington, Mass., 1807, July 22; d. Princeton, Ill., 1902, Jan. 14. He was a brother of William Cullen Bryant (q.v.). He studied at the Rensselaer Polytechnic Institute, Troy, N. Y., removed to Illinois in 1831, and from 1832 until his death lived on his farm at Princeton, performing the greater part of its work with his own hands. He held numerous local offices, served in the State legislature in 1842, and 1858; was a Free-soil candidate for Congress in 1854; and a delegate to the convention which organized the Republican party in 1856. He was an intimate friend of Abraham Lincoln, who appointed him collector of internal revenue for the Fifth Illinois district, 1862–6. The poems which were the product of his leisure hours show him as a lover of nature, which he described minutely and effectively, and a man of refined tastes and kindly feelings. His first printed poem, *My Native Village*, appeared in the *United States Review and Literary Gazette* in 1826, his brother William then being editor of that journal. His collected work may be found in *Poems* (1855), and *Poems Written from Youth to Old Age, 1824–84*, privately printed at Princeton, Ill., in 1885.

BRYANT, Neil, American actor and minstrel performer: b. Keesville, N. Y., 1835; d. Brooklyn, N. Y., 1902, March 6. He was the youngest of three brothers, long prominent in the negro minstrel entertainment business. He made his first appearance on the minstrel

stage in 1845, and soon became the champion American flute-player. With his brothers he opened a theatre at 472 Broadway, New York, in 1857, which they retained for 10 years. The oldest brother having died in 1867, the others continued in the same business in other locations in New York, but after the death of the second brother in 1875, Neil became unsuccessful and lost the most of what he had acquired. He retired from the stage in 1883 and was subsequently employed in the coast survey.

BRYANT, WILLIAM CULLEN: 1794, Nov. 3—1878, June 12; b. Cummington, Mass.; poet and journalist. At the age of 10, he published translations from some of the Latin poets; at 13, he wrote a terse and vigorous political poem, entitled *The Embargo;* and at 18, he composed his *Thanatopsis,* a poem full of beauty. He graduated at Williams College; was admitted to the bar 1815; but after a few years turned to literature. In 1825 he removed to New York, and in association with a friend, established *The New York Review,* to which he contributed many of his best poems. In 1826 he became principal editor of *The Evening Post,* then the leading democratic paper of New York, which he conducted with a manliness and purity of tone that might be imitated by his professional brethren with great advantage to the character of the press. The first collected edition of his poems appeared 1832. They were soon republished in Britain, and were regarded as the highest efforts, up to that time, of the American Muse. In 1842 he published *The Fountain, and other Poems.* Bryant visited Europe 1834, and several times afterward, and records his observations in *Letters of a Traveller in Europe and America.* In 1858 appeared a new edition of his poetical works, and in 1869, a metrical translation of the *Iliad,* followed 1871 by that of the *Odyssey.* His *Orations and Addresses* appeared 1873. Early in 1878 appeared *The Flood of Years,* his last poem of any great length, in which the poet, in strains that remind the reader of *Thanatopsis,* reviews the life of man as the ridge of a wave ever hurrying on to oblivion the forms that appear on its surface but for a moment, concluding, however, with the expression of a confident hope in the future of mankind, even though the present is most dark and drear. At the time of his death he was engaged, in conjunction with Sydney Howard Gay, on a popular history of the United States, the first volume of which appeared in 1876.

See Lives of him by Symington (Glasg. 1881); and by Parke Godwin (2 vols., New York, 1883), who has also edited his *Poetical and Prose Works* (4 vols. 1883–4).

BRYCE, *brīs,* GEORGE: Canadian educator: b. Mount Pleasant, Ont., 1844, April 22. Graduated at the Uni-

versity of Toronto, 1867, and was ordained in the Presbyterian church 1871. He was pastor of Knox and St. Andrew's churches, Winnipeg, in succession; founded Manitoba College, Winnipeg, and aided in founding the University of Manitoba, and for many years filled the post of professor of science and literature in the college; has acted as chairman of the board of examiners of public school teachers for the Province, inspector of schools, Winnipeg, and president of Manitoba Historical Society. His principal works have been *Manitoba: Its Infancy, Growth and Present Conditions* (1881); *A Short History of the Canadian People* (1887); *Remarkable History of the Hudson Bay People* (1900); *Mackenzie, Telkirk and Simpson* (1905).

BRYCE, *brīs*, JAMES, LL.D.: author: b. Belfast, 1838, May 10, son of James B., LL.D., of Glasgow. He was educated in the High School and Univ. of Glasgow, and in Trinity College, Oxford; obtained several univ. prizes; became a fellow of Oriel College, Oxford, 1862; barrister at Lincoln's Inn 1867. From 1870 till his resignation in 1893, he was regius professor of civil law at Oxford. He entered Parliament in 1880 as member for the Tower Hamlets division of London, and since 1885 he has represented South Aberdeen as a Liberal and Home Ruler. He was under-secretary of state for foreign affairs in 1886, chancellor of the duchy of Lancaster and a member of the cabinet in the Liberal ministry of 1892, and two years later he became president of the Board of Trade, a post which he held till the change of government ensuing upon the general election of 1895. In 1905 he became Chief Secretary for Ireland in the Liberal Cabinet of Sir Henry Campbell-Bannerman, and in 1906, December, was appointed ambassador to the United States. He is D.C.L. of Oxford, LL.D. of Edinburgh and Glasgow; in 1894 he was elected a Fellow of the Royal Society, and many foreign honors have been conferred on him. His two most important works are: *The Holy Roman Empire* (1864, afterward enlarged and republished) and *The American Commonwealth* (1888), a very full exposition of the American Constitution, system of government, and administration, political machinery, etc. He has also written: *The Trade Marks Registration Acts, 1875 and 1876, with Introduction and Notes* (1877); *Transcaucasia and Ararat* (1877, 3rd ed. 1878); *Impressions of South Africa* (1897); *Studies in History and Jurisprudence* (1901), *Studies in Contemporary Biography* (1903); etc. He is also author of numerous magazine articles on political, historical, geographical, and educational topics. His *American Commonwealth* was received with large interest in England and the United States.

BRYCE, LLOYD, American editor and novelist; b. Flushing, Long Island, N. Y., 1851, Sept. 20. From

1889 to 1896 he was editor of the *North American Review*. His works include: *Paradise; A Dream of Conquest; The Romance of An Alter Ego; Friends in Exile; Lady Blanche's Salon; The Literary Duet; After Christianity, What?;* etc.

BRYDEN, Henry Anderson, English author: b. 1854, May 3. He was educated at Cheltenham College, and later studied for the bar. In early life he won a national reputation as an athlete, especially as runner. His travels in South Africa have been extensive. Among his books are: *Kloof and Karroo: Sport, Legend, and Natural History in Cape Colony; Gun and Camera in Southern Africa; Tales of South Africa; The Victorian Era in South Africa; Nature and Sport in South Africa; An Exiled Scot* (1899); *Animals of Africa* (1900); *From Veldt Camp Fires* (1900); *Hare-Hunters and Harriers* (1903); *How to Buy a Gun* (1903); *A History of South Africa* (1904); *Nature and Sport in Britain* (1904); *Don Duarte's Treasure* (1904); (part author) *Big Game Shooting* (1905); etc.

BRYMNER, Douglas, Canadian archivist: b. Greenock, Scotland, 1823. Trained for a mercantile career, he was engaged in business until 1856, when ill health compelled his retirement. He emigrated to Canada in 1857, and engaged in journalism, becoming editor of the *Presbyterian* and associate editor of the Montreal *Herald*. In 1872 he was appointed historical archivist of Canada, and for 30 years labored tirelessly in collecting and arranging the historical records and documents of the Dominion. His series of annual reports, each entitled *Report on the Canadian Archives*, constitute a rich treasury of original documents for every phase of Dominion history.

BRYN MAWR: college for women, in a village of the same name on the main line of the Penn. railroad, 10 m. w. of Philadelphia. It was endowed in 1880 by Dr. Joseph W. Taylor, of N. J., for the advanced education of women. In 1884, James E. Rhoads was chosen pres. and M. Carey Thomas dean of the faculty. A year later its doors were thrown open to the students.

Three classes of students are admitted: graduates, undergraduates, and hearers. The hearers must be at least 25 years of age and must have passed a required examination for matriculation. For the undergraduates there is no division into the traditional four classes. The number of years required for graduation is not fixed, though the usual course is four years. Candidates for the degree Ph.D. must have spent three years in graduate work and from two to three years at this college.

Among provisions made for the partial support of students are three public-school scholarships of $100 each, nine of $200 each, and three of $400 each, open to graduates of local institutions. Three scholarships

of $300 each and three of $200 each are awarded as the results of examinations. For the graduate department there are 11 fellowships of $525 each, open to graduates of any college of good standing, and 5 of $200 each to candidates next in merit. Three graduate fellowships of $500 each are given for European study.

The college property consists of seven buildings valued at $1,700,000. There are two halls exclusively for lecture purposes. The library is fitted for special study. It contains 48,000 vols., and $3,000 is expended annually for additions. There is a fine gymnasium with running-track and swimming-bath. Gymnasium practice is required of all resident undergraduates. Athletic grounds and a skating-pond add to the opportunities for recreation. A cottage hospital is provided for the sick.

The college has productive endowment funds amounting to $1,500,000. Annual receipts from benefactions reach over $25,000. The total income, including tuition and incidentals, is $150,000. The necessary cost for a year to the student is placed at about $400, of which $100 is for tuition and $275 for living expenses. The college had (1906) 46 professors and instructors and 456 students. The total number of graduates since the organization of the college was 809, of whom 798 were living.

BRYOLOGY, n. *brī-ŏl'ŏ-jĭ* [Gr. *bru'ŏn*, moss; *logos*, discourse]: the study of mosses; same as 'muscology.' BRYOL'OGIST, n. *-ō-jĭst*, one who.

BRYONY, n. *brī'ŏ-nĭ*, or BRYONIA, n. *brī-ō'nĭ-ă* [L. *bryōnĭă*—from Gr. *bruōnĭă*—from Gr. *brūōn*, abounding—from *bruō*, I abound, from its abundance]: plants of different genera, common in hedges—the roots are powerfully acrid; the white bryony is *Bryonĭă alba*, and the red bryony is *B. dīoi'ca*, ord. *Cŭcur'bĭtācĕæ;* the black bryony is *Tāmus commūnĭs*, ord. *Dĭ'oscōrĕā'cĕæ;* the wild vine; the lady's seal. BRYONIN, n. *brī'ŏ-nĭn*, a yellowish-brown bitter substance obtained from the root.

BRYONY, *brī'o-nĭ (Bryonia):* genus of plants of the nat. ord. *Cucurbitaceæ*, distinguished by triadelphous stamens, with distinct anthers, a trifid style, and a few-seeded fruit destitute of hard rind. The stems climb by means of lateral tendrils, the leaves are angular or 3–5-lobed, and the flowers companulate, 5-partite, unisexual, and generally yellow. The COMMON BRYONY *(B. dioica)*, the only British species, is frequent in hedge-rows in England. It has cordate palmate leaves, axillary bunches of flowers, and red berries about the size of a pea. It abounds in a fetid and acrid juice. The root is perennial, very large, white, and branched, has a repulsive smell, and is acrid, purgative, and emetic. *B. alba*, common in the middle parts of Europe, possesses similar properties. The root of both is applied topically to bruises, and was formerly much in use as a purgative. It is now again much employed in home-

opathic practice. A decoction made of 1 lb. of the fresh root is said by Withering to be 'the best purg for horned cattle.' It contains a bitter extractive, called *Bryonine*, to which it seems to owe its properties. The young shoots of both species are, however, so free from acrid and dangerous qualities, that they may be used as pot-herbs.—The roots of other species of the genus are acrid and purgative; but it is said that the root of *B. Abyssinica*, when cooked, is eaten without danger.—BLACK BRYONY *(Tamus communis)* is a plant of a different nat. ord. *(Dioscoreaceæ*, q.v.). The genus is distinguished by an inferior ovary and succulent fruit. Black B. has long twining stems, cordate undivided leaves, greenish flowers, and red berries. Its roots are very large and fleshy, black externally. The berries are unwholesome, and the whole plant is acrid, the root so much so as to have been formerly employed for stimulating plasters. But the young suckers, in which the acrid principle is not much developed, are eaten in Greece as asparagus, after careful boiling with change of water, as are also those of *T. Cretica*.

BRYOPHYL'LUM [Gr. *bryon*, moss, and *phyllon*, a leaf]: genus of plants of the nat. ord. *Crassulaceæ* (q.v.). *B. calycinum*, a succulent shrubby plant, native of the Moluccas, with quinate or almost pinnate leaves, oblong deeply crenulated leaflets, and panicles of large pendulous greenish-yellow flowers, is frequent in British hothouses, interesting from its producing buds on the edges of the leaves more frequently than almost any other plant. These buds are capable of forming independent plants. The plant is constantly used in botanical laboratories to illustrate a phenomenon incorrectly called regeneration. This curious mode of propagation is found also in the Bog Orchis (*Malaxis paludosa*), a plant of a very different nat. ord. Some common greenhouse ferns also propagate in this way.

BRYOZOA, n. *brī'ō-zō'ă* [Gr. *bru'ŏn*, moss; *zōŏn*, an animal]: a group of invertebrate animals, usually forming plant-like colonies, and having the appearance of branched mosses; a synonym of *Polyzoa* (see ZOOPHYTES). BRY'OZO'AN, a. pertaining to.

BRY'UM [Gr. *bryon*, moss]: genus of Mosses (q.v.) distinguished by a terminal fruit-stalk, a double *peristome* (see MOSSES)—the outer one of 16 teeth, the inner a membrane cut into 16 equal segments—and a dimidiate *calyptra*. The species are very numerous. They all are small, their stems short, and their leaves forming little rosettes, from the centre of which the fruit-stalk springs. They generally grow in dense patches, on wet rocks, wet earth, the bark of trees, etc., beautifully clothing them with bright green.

BRZESC LITEWS'KI: see BREST-LITOVSK.

BUACHE, *bū'āk* or *bō'âsh*, or GARDEN ISLAND: island

of Western Australia, near the mouth of Swan river; lat. 32° 10′ s., long. 115° 40′ e. Though measuring only 6 m. by 1, it is important as sheltering from the open ocean the deep and spacious anchorage of Cockburn Sound, which lies between it and the mainland of the colony.

BUANSUAH, *bô-ăn-sô′a:* a kind of wild dog in India. Some writers have suggested that it is the original of all the domestic dogs.

BU′AZE: South African plant, of which the botanical characters and relations are not yet known, but which is likely to prove of importance on account of its fibre. Dr. Livingstone found it growing in large quantities in the Maravi country, n. of the Zambesi; but he could not procure any specimen in flower or fruit, and Dr. Hooker did not recognize the specimens of branches and leaves. It is not cultivated, and the only use to which it is put by the natives is to afford threads for stringing beads; but Dr. Livingstone thinks its fibre stronger and finer than flax, and says that a firm thread of it feels like catgut in the hand, and would cut the fingers sooner than break.

BUBALUS, *bū′ba-lus*, or BU′BALIS,-*lis*, or BU′BALE,-*lē* *(Antilope Bubalus):* supposed the *Bubalus* of the ancients— though that name is now generally appropriated to the buffalo (q.v.)—a species of antelope, of that section of the genus which is characterized as *bovi*-form or ox-like. The Arabic name is Bekker-el-Wash, which signifies wild ox. It is an animal about the size of a large stag, with very ox-like head and muzzle—the head, however, remarkably long; the horns about as long as the head, surrounded by a succession of thickened rings, curved so as somewhat to resemble the sides of a lyre, the points directed backward. The general color is yellowish-brown, but the tail is terminated by a black tuft. The Bubalus is an animal of rather coarse appearance, destitute of the gracefulness of the typical antelopes. It inhabits Barbary, and occasional wanderers make their way to the banks of the Nile. It is figured on the monuments of ancient Egypt. It is gregarious in its habits. It is said to be easily domesticated. The most nearly related species to this, of other antelopes known, is the KAAMA (q.v.) of south Africa.

BUBASTIS, *bū-băs′tĭs* (the *Pi-beseth* of Scripture, and modern *Tel Basta):* ruined city of Egypt, about 14 m. n. of Belbeys; lat. 30° 36′ n., long. 31° 33′ e. B. derived its name from the Egyptian goddess B., in whose honor a temple was erected here, which, perhaps not so large and magnificent as some Egyptian temples, was, according to Herodotus, one of the most beautiful; and vast numbers of persons were wont to make annual pilgrimages to it. Nothing but some stones of the temple, of the finest red granite, remain. There are some other ruins, and mounds of great extent, con-

sisting chiefly of the remains of brick-houses and heaps of broken pottery.

BUBASTIS: goddess of the Egyptians; in their mythology, the child of Isis and Osiris, and sister of Horus. She was identified by the Greeks with Artemis (Diana), though upon what grounds is unknown, as the best information with regard to her is that she was the goddess who presided over pregnancy and childbirth. The chief temple erected to B. was at Bubastis (q.v). B. is represented on monuments as having the head of a cat, an animal sacred to her.

BUBBLE, n. *bŭb'bl* [an imitative word: Dut. *bobbel;* Dan. *boble;* Sw. *bubbla;* It. *bubbola,* a bubble; Bohem. *bublati,* to murmur: Scot. *bub,* a blast of wind]: a round film or skin of a liquid full of air; anything empty; a false show; something not real and substantial: V. to rise up in air-bells, as on the top of a liquid; to run with a gentle gurgling noise; in *OE.,* to cheat or dupe. BUBBLING, imp. *bŭb'blĭng:* ADJ. running with a gurgling sound: N. the gurgling soft rushing sound of flowing water. BUB'BLED, pp. *-bld.* BUB'BLY, a. *-blĭ,* consisting of bubbles. BUB'BLER, n. in *OE.,* one who cheats or dupes. A BUBBLE SCHEME OR COMPANY, a scheme or enterprise got up entirely for the benefit of the promoters at the expense of the credulous public; a hollow or worthless scheme.

BUBBLE, in a legal aspect as defined by Blackstone: an unwarrantable undertaking by unlawful subscriptions, subjecting the parties who originate and put them in operation to the penalties of *præmunire* (q.v.). The *South-sea Company* (q.v.) was a terrible example of such a Bubble. The BUBBLE ACT is the name given to the 6 Geo. I. c. 18, 'enacted,' says Blackstone, 'in the year after the infamous South-sea project had beggared half the nation,' and which public fraud the act was intended to punish. But it was repealed by the 6 Geo. IV. c. 91, which at the same time left such companies to be dealt with by the common law.

BUBBLE SHELL, the thin, inflated bubble-like shell of a gastropod mollusk *(Bulla),* the shell usually without a spire. On each side of the head is a large swimming flap (epipodium), and one species flits about in shallow pools on mud flats. Our eastern Atlantic coast species are *Bulla occidentalis* and *Haminea solitaria,* the latter found in Vineyard Sound. They mostly live in rather deep water, at least below low-tide mark.

BUBNA UND LITTITZ, *boob'na, lĭt-tĭtz',* FERDINAND (COUNT OF), Austrian field marshal: b. Zamersk, Bohemia, 1768; d. Milan, 1825, June 6. He was early in life, the chamberlain of the emperor of Austria, afterward entered the military service, and after distinguishing himself on various occasions, at Manheim, in the defense of Bohemia (1800), and at Austerlitz, gained

at Wagram, in 1809, the rank of field-marshal-lieutenant. In the war of 1813 he commanded an Austrian division with much honor, was present at the battles of Lützen, Bautzen, Dresden, and Leipsic, and in 1814 received the chief command of the Austrian army which was to pass through Geneva to the south of France. He advanced upon Lyons, but was unsuccessful, till the corps of Bianchi and Hessen-Homburg came to his assistance. Bubna remained at Lyons till the return of the allied forces, and then retired to Vienna. After the landing of Napoleon in 1815, he again led a corps against Lyons, and in Savoy opposed Marshal Suchet, till Paris was conquered, and the marshal retreated beyond Lyons. He then took possession of Lyons without opposition, established a court-martial to punish the disturbers of public order, and proceeded with greater severity than on his former campaign. In September he marched back to Austria, and received for his services valuable estates in Bohemia from the emperor. In the insurrection of Piedmont, 1821, the Count de Bubna received the chief command of the Austrian troops destined to restore the ancient government. After the accomplishment of this commission, he was appointed general commandant of Lombardy.

BUBO, n. *bū'bō, plu.* BUBOES, *bū'bōz* [mid. L. *bubo*, an ulcer—from Gr. *boubōn*, the groin: F. *bubon*]: a swelling of the lymphatic glands, especially those of the groin and armpit. BUBONOCELE, n. *bū-bŏn'ŏ-sēl* [Gr. *kēlē*, a tumor]: a rupture in which the intestines break down into the groin; inguinal hernia. BUBONIC, a *bū-bŏn'ĭk*, pertaining to swellings of the inguinal and axillary glands.

BUBONIC PLAGUE, a disease considered identical with the Black Death, having its origin in China, and first appearing in Europe in 543 A. D. at Constantinople. See PLAGUE.

BUCCANEERS, or BUCCANIERS, n. plu. *buk'ă-nērz'* [from the Carib language—*barbaco'a*, a kind of grate on which flesh was cooked for a feast; *boucan*, the place of such a feast: F. *boucaner*, to cook and smoke flesh at the same time]: persons who, in the W. Indies and S. Amer., hunted wild animals for their skins, and rudely preserved much of the flesh by drying it after the Indian fashion, called *bucaning*. BUC'CANEER'ING, n. *-nēr'ĭng*, the practice or profession of a buccaneer.

The term Buccaneers was applied to a celebrated association of piratical adventurers, who, from the commencement of the second quarter of the 16th c. to the end of the 17th, maintained themselves in the Caribbean seas by reprisals on the Spaniards, and by piracy. The assumption by Spaniards of a divine right—sanctioned by the pope's bull—to the whole new world, was not, of course, to be tolerated by the enterprising mariners of England and France: and the cruelties practiced

by the Spaniards on all foreign interlopers, of which the history of that time is full, naturally led to an association for mutual defense among the adventurers of all other nations, but particularly among the English and French, to which may be added the Dutch. The fundamental principles of their policy—for they, in course of time, formed distinct communities—were close mutual alliance, and mortal war with all that was Spanish. Their simple code of laws bound them to a common participation in the necessaries of life; locks and bars were proscribed as an insult to the general honor; and every man had his comrade, who stood by him when alive, and succeeded to his property after his death. The principal centre of their wild and predatory life was for some time the island of Tortuga, near St. Domingo. When they were not hunting Spaniards, or being hunted themselves, their chief occupation and means of subsistence was the chase. From the flesh of wild cattle they made their 'boucan;' their skins and tallow they sold or bartered to Dutch and other traders. The history of these men embraces, as may be supposed narratives of cruelty and blood-shed unsurpassed in the annals of crime. It has, however, not a few stories of high and romantic adventure, of chivalrous valor, and brilliant generalship. Among the 'great captains' whose names figure most prominently in the records of buccaneering, were the Frenchman Montbars, surnamed by the terrible title of 'The Exterminator;' his countrymen, Peter of Dieppe, surnamed 'The Great'—as truly, perhaps, as many others so distinguished—and L'Olonnais, Michael de Busco, and Bartolomeo de Portuguez, Mansvelt, and Van Horn. Pre-eminent, however, among them all was the Welshman, Henry Morgan, who organized fleets and armies, took strong fortresses and rich cities, and displayed throughout the bold genius of a born commander. He it was that led the way for the B. to the Southern Ocean, by his daring march in 1670 across the Isthmus of Panama to the city of that name, which he took and plundered after a desperate battle. This brilliant but most unscrupulous personage was knighted by Charles II., and became deputy-gov. of Jamaica. A higher subordination of the love of gold to the passion for dominion in him, might probably have made him emperor of the West Indies, some dream of which seems at one time to have occupied his mind. In 1680 and 1689, extensive buccaneering expeditions were made to the Pacific, even as far as the coasts of China, of which the best record is preserved in the lively pages of William Dampier, himself an important partner in these bold adventures. The war between France and Britain, after the accession of William III., dissolved the ancient alliance of the French and English B. After the peace of Ryswick, and the accession of the Bourbon Philip V. to the Spanish crown (1701), they finally disappeared, to make way for a gang of mere cut-throats and vulgar desperadoes, not yet utterly extinct. The last great event in their history was the capture of Carthagena 1697, where the booty was enormous.—See Burney's *History of the B.*

(Lond. 1816); Thornbury's *Monarchs of the Main* (1855); and *Les Flibustiers au XVII. Siècle* (Limoges, 1884).

BUCCARI, *bôk-kâ'rē*, or BAKAR: free port of Austrian Croatia, on an inlet of the Gulf of Quarnero, 5 m. e.s.e. from Fiume. It is beautifully situated on the slope of a hill, and has a small but very good and safe harbor. The linen manufacture is carried on here, and ship-building is actively prosecuted; but the inhabitants are principally sailors and fishermen. The tunny fishery is the chief fishery of this part of the Adriatic. The vine is extensively cultivated in the neighborhood of B., and good wine is made. Pop. about 3,000.

BUCCINATOR, n. *bŭk'sĭ-nā'tẽr* [L. *buccĭna*, a kind of trumpet—from *bucca*, the cheek]: a muscle forming a large part of the cheek—so called from being used in blowing wind-instruments. BUCCINAL, a. *bŭk'sĭn-ăl*, trumpet-like. BUCCINUM, n. *bŭk-sī'nŭm*, a genus of shell-fish, including the common whelk (q.v.).

BUCCINO, *bôt-chē'nō:* town of s. Italy, province of Salerno, pleasantly situated on the Botta, which at this point is crossed by an old Roman bridge; about 14 m. e. from Campagna. In its vicinity are quarries yielding fine marble. Pop. 7,000.

BUCCLEUCH, *bŭk-klô':* family of the Scotts, Dukes of B.; one of the oldest and most distinguished in Scotland. The family traces its descent from Sir Richard le Scott, in the reign of Alexander III. (1249–85); but the ancestor who first becomes historically conspicuous is Sir Walter Scott of Branxholm and B., a brave and powerful chieftain on the border. B., which from this early period was destined to be associated with the family title, is a lonely estate in the vale of Rankleburn, at the head of Ettrick, Selkirkshire. The Sir Walter alluded to flourished in the reign of James V., and on some incidents in his life, his great namesake founded the *Lay of the Last Minstrel*. Sir Walter fought bravely at the battle of Pinkie, 1547, and was slain in an encounter with Sir Walter Kerr of Cessford in the streets of Edinburgh, 1552.

He was succeeded by his grandson, Sir Walter Scott of B., a knight 'wise, true, and modest,' who was succeeded by his only son, who bore the same name. This Sir Walter is celebrated for his military exploits on the border; one of which was the rescue of one of his attendants, Kinmont Willie, from the castle of Carlisle. (See *Minstrelsy of the Scottish Border*). For his services to the state, in which is to be reckoned his carrying away of large numbers of the border marauders to foreign wars, he was raised to the peerage, 1606, as Lord Scott of B. Dying 1611, he was succeeded by his only son, Walter, who, 1619, received an elevation in the peerage, as Lord Whitchester and Eskdale, and Earl of B. Through his son Francis, the second earl, the family, by a grant, acquired the extensive domain of Liddesdale, formerly belonging to the House of Bothwell; also, by purchase, large territories in Eskdale; and in 1642, the barony of Dalkeith from the Morton family.

Francis left only two daughters, the eldest of whom dying without issue, the titles and estates went to her sister, Anne, who, 1663, was married to James, Duke of Monmouth (q.v.), illegitimate son of Charles II. The pair were created Duke and Duchess of B.. Earl and Countess of Dalkeith, etc. After a marriage of 22 years, the unhappy duke, on a charge of rebellion, was tried and beheaded, 1685, the duchess, however, retaining her honors, title, and estates, as in her own right. The duke left a family of four sons and two daughters. The duchess afterward married Lord Cornwallis, by whom she had a son and two daughters, and died in 1732, at Dalkeith House, where she had occasionally resided in princely splendor. James, her eldest surviving son, died previous to his mother, and his son, Francis. by the death of his grandmother, succeeded to the title of Duke of B. Notwithstanding the connection with the son of Charles II., the family still preserved the surname of Scott. Duke Francis, 1743, obtained a restoration of his grandfather Monmouth's Earldom of Doncaster and Barony of Tynedale, and was hence a British peer. In 1720, he married a daughter of James, second Duke of Queensberry, and by this fortunate connection a portion of the Queensberry estates, with the dukedom, merged in the family of B. 1810.

Henry, third Duke of B., b. 1746, was the greatest and most estimable of his family. He had for his tutor and friend Dr. Adam Smith, and his beneficent talents were directed to the improvement of his extensive estates in the s. of Scotland, by the amelioration of the soil, the planting of trees, the making of roads, the improving of the breed of sheep, and the social elevation of his numerous tenantry.

His son Charles, duke from 1812–19, was succeeded by the fifth duke, his son, Walter Francis, 1806–84. The fifth duke, like his grandfather, was noted for the improvement of his estates, which in Scotland are in Mid-Lothian, Dumfriesshire, Roxburghshire, Selkirkshire, Peeblesshire, Lanarkshire, and stewartry of Kirkcudbright. The island of Inchkeith (q.v.) also belongs to the ducal possessions. The greatest public improvement ever executed in Scotland by an individual, at his own private cost, was carried out by the fifth Duke of B. at vast expense—the creation of the deep-water harbor and port of Granton, on the Firth of Forth, two m. from Edinburgh.

The fifth duke was succeeded by his eldest son. The Duke of B. holds also the titles of Duke of Queensberry, Marquis of Dumfriesshire, Earl of Drumlanrig, B., Sanquhar, Dalkeith, etc., in the peerage of Scotland; and Earl of Doncaster, etc., in that of England. The courtesy title of the duke's eldest son is Earl of Dalkeith. See W. Fraser's *Scotts of Buccleuch* (2 vols. 1879).

BUCENTAUR, n. *bū-sĕn'tawr* [Gr. *bous*, an ox; *kentau'ros*, a centaur]: in *myth.*, a monster, half man, half ox; [It. *bucentoro*]: the state barge of the Doge of Venice, celebrated in the annals of that state when it was a flourishing republic. The Italian name is *bucentoro* or *bucintoro*, of which the etymology has been much debated. But it

seems to be a word compounded on the analogy of *hippocentaur* [Greek *hippos* and *kentauros*], a name used of the Centaurs (q. v.) in the form in which they were ultimately depicted, half horse, half man. B. would thus be properly a figure half bull [Gr. *bous*], half man; such as may presumably have been represented on the state barge in some way. A bucentaur was known as early as the end of the 12th c.; and a vessel of the same name was burnt when the French took Venice more that six centuries afterward; but it is not certain whether this was the same vessel, maintained by being repeatedly patched up with new ribs and planking. The B. is described as having been a galley, about 100 ft. long by 21 in extreme breadth; on a lower deck were 32 banks or rows of oars, manned by 168 rowers; and on an upper deck was accommodation for the illustrious visitors who occasionally came on board. All the fittings were most gorgeous. Although propelled mainly by oars, there were 40 mariners employed in other ways to manage the galley. The B. was employed only once a year, when the Doge 'married the Adriatic.' A splendid water-procession was formed, with the Doge and the chief notables in the B., and other distinguished persons in gondolas and feluccas; and when the vessels arrived at the mouth of one of the channels opening into the Adriatic, the Doge dropped a ring into the water, using the words: 'We wed thee with this ring, in token of our true and perpetual sovereignty.' This singular ceremony, which took place on Ascension Day, arose out of an honor or privilege conferred by the pope on the Doge in 1177, consequent on a splendid victory gained by the Venetians over the Emperor Frederick Barbarossa.

BUCEPHALUS, *bū-sĕf'a-lŭs* [Gr., ox-head]: name of the favorite charger of Alexander the Great; probably also the name of a peculiar breed of horses in Thessaly. According to tradition, Alexander in his boyhood was the first to break in the steed B., and thus fulfilled the condition stated by an oracle as necessary for gaining the crown of Macedon.

The town BUCEPHALIA, on the river Hydaspes, India, was founded near the grave of Bucephalus, which died during Alexander's Indian expedition.

BUCER, *bût'sèr*, MARTIN: 1491–1551, Feb. 27; b. Schlettstadt, Alsace: one of the church reformers of the 16th c. His real name was *Kuhhorn* (cow-horn), but in accordance with the fashion of his time among scholars, he changed it into its Greek equivalent—Bucer being derived from *bous*, an ox, and *keras*, a horn. At the age of 14 he entered the order of Dominicans. At the suggestion of his superior he went to Heidelberg to study theology, giving attention, however, at the same time to the Greek and Hebrew languages. While young, he was appointed chaplain to the Elector of the Palatinate. An acquaintance with the works of Erasmus had already inclined B. toward Protestantism, and his views were confirmed by the

influence of Luther at the Heidelberg disputations, 1518. Following the example given by Luther at the Diet of Worms (1521), Bucer became one of the boldest and most decided of the German reformers. In 1523 he went to Strasburg, where he introduced the doctrines of the Reformation. In the disputes between Luther and Zwingli, he adopted a middle course, and endeavored to make reconciliation between them; but his view of the sacraments, which approached that of Zwingli, exposed him to Luther's harsh reprobation. At the Diet of Augsburg, where he conducted himself with great circumspection and moderation, he generally accorded with the Lutheran views, but, with other Strasburg theologians, declined to subscribe to the proposed confession of faith, and afterward drew up the *Confessio Tetrapolitana*. An agreement, however, was subsequently entered into between Bucer and the Lutherans, and as a disciple of Luther, he appeared at the religious conference of the Reformers held at Leipsic. In consequence of his refusal to sign the *Interim*—a temporary creed drawn up by order of the Emperor Charles V.—Bucer found his situation irksome in Germany, and therefore accepted the invitation of Abp. Cranmer (1549), and came to England to teach theology at Cambridge, and assist Paul Fagius and others in forwarding the Reformation. His modesty, blameless life, and great learning gained many friends in England; but his labors were soon interrupted by death. His remains were interred in a church at Cambridge with great solemnity; but during the reign of Mary, his bones, with those of Fagius, were taken from their graves, and burned in the market-place. His constant attempt to express himself in language agreeable both to Luther and Zwingli, induced in him at times an obscure, ambiguous, and elusive kind of thought, to which, perhaps, Bossuet refers when he stigmatizes Bucer as 'the great architect of subtleties.' Bucer was, of course, exposed to many censures and scandals by the contemporary Rom. Cath. theologians, whose fertile imaginations were assiduously employed in that direction during the reformation period; but by Protestant writers he has been highly commended and by some has been ranked above even Luther and Melanchthon. His best work is a translation and exposition of the Psalms, which he published under the pseudonym Aretinus Felinus (Strasburg, 1529). Hubert intended to edit the whole of Bucer's writings in ten volumes, but only one vol. appeared (Basel, 1577).

BU'CEROS: see HORNBILL.

BUCH, *bôch*, LEOPOLD VON: 1774, Apr. 26—1853, Mar. 4; b. Stolpe, Prussia: celebrated German theologist. He received instruction under Werner at the Mining Acad., Freiberg. He afterward travelled in pursuit of his favorite science, through all the states of Germany, Scan-

dinavia as far as the North Cape, and several parts of Great Britain, France, and Italy, visiting the Canary Islands, 1815. His chief writings are: *Geological Observations during Travels in Germany and Italy* (1802–1809); a *Physical Description of the Canary Islands* (1825); *Travels in Norway and Lapland* (1810); and essays *On the Jura in Germany* (1839); and *On the Mountain Systems of Russia* (1840); with several monographs on Ammonites (1832), and other fossils. He was also the author of an excellent geological chart of Germany and its neighboring states (42 sheets, 2d ed., Berlin, 1832). He died in Berlin. B. has been described as 'the only geologist who has attained an equal fame in the physical, descriptive, and natural history departments of his science. In all these, he was an originator and a discoverer.'

BUCHAN, *buch'an:* n.e. district of Aberdeenshire, Scotland, consisting of about a fourth of the county; between the Ythan and the Doveran. Its surface is undulating, the highest points being Mormond Hill in the n., 769 ft., and Dudwick Hill in the s., 572 ft. Portions of the coast are bold and precipitous, especially for a few miles e. of the Doveran mouth, where Troup Head is 366 ft. high; and s. of Peterhead, where the coasts rise from 70 to 200 ft. Among the rocks five miles s. of Peterhead are the famous Bullers of Buchan, a huge vertical well in the granite margin of the sea, 50 ft. diameter and 100 ft. deep, into the bottom of which the sea rushes by a natural archway, and in storms, dashes up the sides with great violence. The e. parts of Buchan consist chiefly of granite and gneiss, and the w. of clay-slate and old red sandstone. The chief seats of population are Peterhead, Fraserburgh, Macduff, and Turriff. Buchan contains several so-called Druid circles, as well as the remains of the Abbey of Deer, and of several castles belonging to the Comyns, who held the earldom of Buchan, but forfeited their title and property 1309.

BUCHAN, *bŭk'ăn*, ALEXANDER, Scottish meteorologist: b. Kinnesswood, Kinross-shire, Scotland, 1829, April 11. He was a teacher in Edinburgh, 1848–60, becoming in the latter year secretary to the Scottish Meteorological Society and in 1878 curator of the library and museum of the Royal Society of Edinburgh. He has published *A Handy Book of Meteorology* (1867); *Introductory Text-Book of Meteorology* (1871). He contributed to the Encyclopædia Britannica, 9th edition, the article on *Meteorology;* to the 'Challenger' reports Atmospheric Circulation (1889), and *Oceanic Circulation* (1895); and with Sir Arthur Mitchell wrote *Weather and Health of London.*

BUCHAN, DAVID: 1780–1837 (or 9?): British arctic explorer. In 1810, he was commander of a schooner on the Newfoundland station and ascended the River of

Exploits. He was commander of the Newfoundland station 1823, and in 1825, high-sheriff of the colony. In 1818, he made his first expedition in search of the north pole, reached 80° 34′, where he encountered impassable barriers of ice; and drifted with the currents until his vessel was disabled. He succeeded, however, in returning to England, and reported important facts in regard to ocean currents and the variation of the needle. He undertook another voyage to the arctic seas, but never returned; and in 1839 the admiralty erased his name from the list of living captains.

BUCHAN, Elspeth: see Buchanites.

BUCHAN, John, Scottish novelist: b. Perth, Scotland, 1875, Aug. 26. He was educated at Glasgow University and Brasenose College, Oxford. His published books include *Sir Quixote* (1895); *Musa Piscatrix* (1896); *Scholar Gipsies* (1896); *Sir Walter Raleigh* (1897); *John Burnet of Barns* (1898); *A History of Brasenose College* (1898); *Grey Weather* (1899); *A Lost Lady of Old Years* (1899); *The Half-hearted* (1900); *The Watcher by the Threshold* (1902); *The African Colony* (1903); *The Taxation of Foreign Income* (1905).

BUCHAN, William, Scottish physician: b. Ancrum, Roxburghshire, 1729; d. 1805. He commenced practice at Edinburgh, and having for a considerable time directed his attention to a digest of popular medical knowledge, published in 1769 his work entitled *Domestic Medicine; or, the Family Physician*,—an attempt to render the medical art more generally useful by showing people what is in their own power, both with respect to the prevention and cure of diseases. It is constructed on a plan similar to that adopted by Tissot in his *Avis au Peuple*. It appealed to the wants and wishes of so large a class of the community, that, considering it to have been the first work of the kind published in Britain, there is no wonder that it should have attained success. Before the death of the author 19 large editions had been sold. Duplanil of Paris, physician to the Count d'Artois (Charles X.), published a translation in five volumes, with notes, which rendered the work so popular on the Continent that in a short time no language in Christendom wanted its translation.

Among the testimonies of approbation which Dr. Buchan received from abroad was a huge gold medallion, sent by the Empress Catherine of Russia, with a complimentary letter. Buchan published two other works: *A Treatise on Gonorrhœa; An Advice to Mothers on the Subject of their own Health, and on the Means of Promoting the Health, Strength and Beauty of Their Offspring.* He was buried in Westminster Abbey.

BUCHANAN, *bū-kăn′ăn*, Andrews Hays, American

educator: b. Washington County, Ark., 1828, June 28. He was graduated at Cumberland University in 1853; and took a special course in civil engineering and mathematics in Lincoln University; taught civil engineering in 1854–61; was military topographical engineer in the Confederate army during the Civil War; and became professor of mathematics and civil engineering in Cumberland University in 1869. He was employed by the superintendent of the United States Coast and Geodetic Survey to take charge of the triangulation of Tennessee, on which work he was engaged for four months in every year from 1876 to 1896. He was the author of *Plane and Spherical Trigonometry;* etc.

BUCHANAN, Francis, Scottish traveler: b. Stirlingshire 1762, Feb. 15, d. 1829. He traveled extensively in the East Indies, making collections illustrative of the botany, zoology, etc., of the countries which he visited, and published *A Journey from Madras Through the Countries of the Mysore, Canara, and Malabar, Performed Under the Orders of the Marquis Wellesley for the Purpose of Investigating the State of Agriculture, Arts, and Commerce, etc., History, Antiquities, etc., in the Dominions of the Rajah of Mysore* (1807). He contributed largely to the scientific journals of the day, and in 1819 published a *History of the Kingdom of Nepal* and in the same year a *Genealogy of the Hindu Gods,* which he had drawn up some years before with the assistance of an intelligent Brahmin. In 1822 appeared his *Account of the Fishes of the Ganges* with plates.

BUCHANAN, Franklin, American naval officer: b. Baltimore 1800, Sept. 17; d. Talbot County, Md., 1874, May 11. At an early age he entered the navy, becoming lieutenant in 1825 and master-commandant in 1841. The organization of the United States Naval Academy was committed to him in 1845 and he was made the first superintendent. During the Mexican war he took part in the siege of Vera Cruz. In Commodore Perry's expedition to Japan he had command of the flagship. In 1855, he was raised to the rank of captain, and in 1861 resigned from the United States navy, intending to follow his State in secession, but later asked to be restored. Upon the refusal of his request, he entered the Confederate navy. In command of the Merrimac in Hampton Roads, he sank the Congress and the Cumberland, being severely wounded during the engagement. After promotion to the rank of admiral in the Confederate navy he commanded at the battle of Mobile Bay, where he was defeated by Farragut, lost a leg, and was made prisoner. At the close of the War he became president of the Agricultural College of Maryland.

BUCHANAN, George, Scottish surgeon: b. Glasgow, 1827. He became surgeon of the Western Infirmary of Glasgow and later served as civil surgeon with the

British army in the Crimean war. In 1888 he was elected president of the surgical section of the British Medical Association, and in 1900 was appointed professor of clinical surgery in the Glasgow University. He was the author of *Camp Life in the Crimea; On Lithotrity, with Cases; Clinical Surgery; Radical Cure of Inguinal Hernia in Children; Talipes Varus; Faure's Storage Battery and Electricity in Surgery;* and *Anæsthesia Jubilee, a Retrospect.* He was one of the editors of the *Glasgow Medical Journal,* and also edited the 10th edition of the *Anatomist's Vade Mecum.*

BUCHANAN, *būk-ăn'an,* GEORGE: 1506, Feb.—1582, Sep. 28; b. Killearn, county of Stirling, Scotland: one of the most learned men of the 16th c., distinguished poet and historian. His parents were poor, and he was sent to the Univ. of Paris by his uncle, who died two years afterward, leaving Buchanan without the means of prosecuting his studies. He returned home, served in one campaign against the English, and entered St. Andrews Univ. 1524, where, in the following year, he took his degree of B.A. In 1526 he went to Paris and became a student in the Scots College there. He subsequently obtained a professorship in the college of St. Barbe, but returned to Scotland about 1537. During his residence on the continent, Buchanan adopted the reformed faith. A satire entitled *Somnium,* exposing the Franciscans, brought upon him the wrath of the priests; and he had resolved upon seeking safety in his old college at Paris, when King James V. took him under his protection, and intrusted him with the education of one of his illegitimate sons. At the request of the king, Buchanan wrote another and more pungent satire against the monks, entitled *Franciscanus,* increasing their anger, and rousing especially the bitter hatred of the powerful Cardinal Beaton, who, after a time procured Buchanan's arrest, and even went so far as to offer the king money for his life. Though to James was entirely due the publication of the offensive satire, he did not interfere to protect the poet, who, however, contrived to effect his escape to Paris. After spending some years at Bordeaux and Paris in teaching, he accompanied the learned Portuguese, Govea, to the Univ. of Coimbra, Portugal. After the death of Govea, Buchanan was arrested as a heretic, and was for some time detained in a monastery, where he began his splendid Latin metrical version of the Psalms. In 1551, being restored to liberty, he went to England; but soon afterward went to Paris. About 1560, he returned to Scotland where he made an open confession of Protestanism. His reputation as a scholar gained for him a good reception at the court of the young queen, Mary, whose classical tutor he became. But his religious and political principles attached him to the party of the Regent Moray, by whose influence he was

appointed principal of St. Leonard's College, in St. Andrews Univ., 1566. In the following year, he was chosen moderator of the general assembly—a very high honor for a layman. The doings of Mary, which scandalized the Scottish public, disgusted her tutor also, and he accompanied the Regent Moray to England, in order to give evidence against her before the commissioners appointed by Elizabeth to inquire into her guilt. His *Detectio Mariæ Reginæ*, laid before these functionaries, was industriously circulated by the English court. In 1570, Buchanan was appointed tutor to the young king, James VI. (afterward James I.), who owed to him all the erudition of which in later life he was so vain. No considerations of the future position of his pupil were allowed to interefer with Buchanan's treatment of him, which was strict, if not even stern; and in dedicating his *De Jure Regni apud Scotos* to the young monarch 1579, he warned him against favorites with a freedom remarkable not only in a subservient but in any age. In 1570, Buchanan was appointed director of chancery, which he soon resigned, and in the same year was made keeper of the privy seal, an office which he retained until within a short time of his death. The latter years of his life were devoted to the composition of his *History of Scotland* (pub. 1582). He died thirty days after its publication, and was buried in Greyfriars churchyard, Edinburgh. As a scholar Buchanan was unrivalled in his age, and he wrote Latin poetry 'with the purity and elegance of an ancient Roman.' He was alike humorous, sarcastic, and profound. His *History*, written in Latin, is remarkable for the richness, force, and perspicuity of its style, though it has been found fault with for the partiality of its narration of contemporary events; and two years after the author's death, it as well as *De Jure Regni*, etc., was condemned by the Scottish parliament, and every person possessed of copies was ordered to surrender them within 40 days, in order that they might be purged of 'the offensive and extraordinary matters' they contained. Two collected editions of Buchanan's work have been published—one by Ruddiman 1715, 2 vols. folio; and another by Burman, Leyden, 2 vols. 4to. 1725. The translations that have yet appeared are far from doing justice to the original. See Life by David Irving (2d ed. 1817).

BUCHANAN, James, fifteenth president of the United States: 1791, Apr. 23—1868, June 1; b. Mercersburg, Penn. He graduated at Dickinson College 1809, studied law, and began practice at Lancaster 1812. His early political affinities were with the 'federalists;' his first public address being made after the capture of Washington by the British in 1814, in which, although in common with his party he disapproved of the war, he

yet urged the enlistment of volunteers for the defense of Baltimore, which was then seriously threatened, and was himself one of the first to enlist. After the conclusion of peace he delivered in 1815 a Fourth of July oration in which he characterized the war with Great Britain as 'glorious in the highest degree to the American character, but disgraceful in the extreme to the administration.' He was elected to the Pennsylvania legislature 1814, and again 1815, after which he applied himself to the practice of his profession, in which he soon rose to distinction. His intention at this time was to retire wholly from public life, but the death of his affianced bride in 1820 caused him to seek for a change for diversion of thought, and he accepted a nomination to congress, taking his seat 1821, Dec. He never married, but the orphan children of his sisters became to him as sons and daughters. He was elected to congress as a federalist, but in the disruption of parties which ensued after the election of Mr. Monroe as president, he affiliated with the party then known as 'republican,' subsequently as 'democratic republican,' ultimately as 'democratic.' In 1829 he was made chairman of the Judiciary Committee in the house of representatives. He remained a member of congress until 1831, March 3, being recognized as a leader of the democratic party in opposition to the administration of John Quincy Adams, and in support of that of Andrew Jackson.

At the close of the second year of Jackson's administration Mr. Buchanan wished to retire to private life; but at the earnest desire of President Jackson he accepted the appointment of minister to Russia, arriving at St. Petersburg, 1832, June. He held this position until August of the next year, when, after a short time in Paris and London, he returned to his home in Lancaster, devoting himself mainly to his private affairs, until 1834, Dec. when he was elected to the U. S. senate to fill a vacancy occasioned by the resignation of Mr. Wilkins, who had been appointed minister to Russia. He was, by successive re-election, a U. S. senator till 1845, when Mr. Polk, who was beginning his presidential term, offered him the position of secretary of state, which he held until 1849, when the opposition party, which had assumed the name of 'whig,' came into power. In 1853 the democrats again came into power, having elected Franklin Pierce as president, who urged Mr. Buchanan to accept the appointment of minister to Great Britain, a position which he reluctantly accepted, and filled with marked ability till 1856.

Meanwhile the anti-slavery—or more properly the 'free soil'—movement had been gaining strength. The 'whig' party was dissolved; the southern whigs virtually going over to the democrats, while the northern whigs uniting with the free-soil democrats, organized a new party, which assumed the name of 'republican.'

JAMES BUCHANAN.

Fifteenth President of the United States.

The democratic national convention of 1856 nominated for president Mr. Buchanan, then minister to Great Britain. He received the electoral vote of all the slave-holding states (except the eight votes of Maryland, cast for Millard Fillmore), beside the 62 votes of California, Illinois, Indiana, New Jersey, and Pennsylvania —174 in all. Mr. Fremont, the republican candidate, received the 114 electoral votes of the remaining free states. Of the entire popular vote of the Union about 1,838,000 were cast for Buchanan, 1,341,000 for Fremont, 875,000 for Fillmore.

Mr. Buchanan had several years before placed himself upon record upon the great political question of the time. He had opposed the 'Wilmot Proviso' of 1846, by which slavery was to be excluded from all newly acquired territory; had advocated Henry Clay's 'Compromise Measures' of 1850; and had declared that, 'Two things are necessary to preserve the Union from danger: (1) Agitation in the North on the subject of Southern slavery must be rebuked and put down by a strong and enlightened public opinion; (2) The fugitive-slave law must be enforced in its spirit.' These views were in substance repeated and elaborated in his various presidential messages.

The virtual election, in 1860, Nov., of Mr. Lincoln to the presidency, was the signal for secession. Only a few months of Mr. Buchanan's term remained, and his policy was apparently mainly directed to two points: (1) To confine the area of secession, so that if there was to be a Southern Confederacy it might be confined to the cotton states: (2) To induce congress to prepare for a civil war, in case one should be precipitated. When commissioners were sent by the Southern Confederacy to negotiate for a separation he refused to receive them in any other capacity than that of eminent private citizens, and as late as 1861, Jan. 8, he sent a special message to congress, urging the adoption of the 'Crittenden Compromise,' which provided in substance that the Missouri compromise-line of 36° 40′ should be re-adopted, and that this question should be submitted to the people of the several states. The republican majority in congress refused to act in accordance with the recommendations of the president. Probably—and not without plausible reasons—they put little faith in his sincerity, and none at all in his firmness. At all events, between the president and congress nothing was done to provide for the emergency which hourly became more pressing. Immediately after the inauguration of Mr. Lincoln, Mr. Buchanan returned to his home at Lancaster, where the remaining seven years of his life were passed. Here he lived in retirement, although, we are told by his biographer, he took a lively interest in public affairs, always supporting, with his influence, as a private citizen, the maintenance

of the war for the restoration of the Union. He died at Lancaster.

Besides his numerous speeches in congress, diplomatic dispatches, and presidential messages, Mr. Buchanan published only his book *Buchanan's Administration* (1866), in which he vindicated the course which he had pursued. *The Life of President Buchanan* has been written, in a highly eulogistic manner, by Mr. George Ticknor Curtis (2 vols. 1883).

BUCHANAN, John Lee, American educator: b. Smyth Co., Va., 1831, June 19. He was graduated from Emory and Henry College in 1856 and was professor of ancient languages there from 1856–78; was professor of Latin in Vanderbilt Univ. 1878–79; president of Emory and Henry College 1879–80; president of Virginia Agricultural and Mechanical College 1880–82; joint principal Martha Washington College 1882–86; state superintendent of public instruction of Virginia 1886–90; professor of Latin, Randolph-Macon College 1890–94; and from 1894–1902 was president of the Univ. of Arkansas. He published *Educational Reports* of Virginia (1886–90).

BUCHANAN, Robert Christie, American soldier: b. Baltimore about 1811; d. Washington 1878, Nov. 29. He graduated at the United States Military Academy in 1830, and served in the Black Hawk war in the rank of second lieutenant: From 1837–8 he served in the Seminole war, and from 1845–6 in the military occupation of Texas. During the Mexican was he was promoted for gallantry. In 1856 he was placed in command of the military district of Oregon and northern California. Early in the Civil War he was promoted lieutenant-colonel. He fought in the Peninsular campaign, and on the Rappahannock, winning at Gaines Mills the rank of brevet-colonel, and at Malvern Hill that of brevet-brigadier-general. He was in the battles of Antietam and Fredericksburg, and was promoted brevet-major-general. In 1864 he was assistant provost-marshal for New York. In 1870, he retired from active service.

BUCHANAN, Robert Williams, English poet and novelist: b. Caverswall, Staffordshire, 1841, Aug. 18; d. London, 1901, June 10. He received his education in Glasgow, and while young went to London to engage in literature. His attack upon Dante Gabriel Rossetti, *The Fleshy School of Poetry*, drew a famous letter from that poet on *The Stealthy School of Criticism*, and a scathing pamphlet from Swinburne, *Under the Microscope* (1872). It should be added that in later life he regretted his course in the matter. His poems include *Undertones* (1863); *Idylls and Legends of Inverburn* (1865); *London Poems*, his best effort (1866); *North Coast Poems* (1867); *Book of Orm, the Celt* (1868); *St. Abe and His Seven Wives* (1871); *Napoleon Fallen: a Lyrical Drama* (1871); *The Drama of Kings* (1871);

Ballads of Love, Life and Humor (1882); *The City of Dreams* (1888); *White Rose and Red; The Wandering Jew* (1893). His best novels are *The Shadow of the Sword* (1876); *A Child of Nature* (1879); *God and the Man* (1881); *The Martyrdom of Madeline* (1882); and *Foxglove Manor* (1884).

BUCHANAN, William Insco, American diplomat b. near Covington, Ohio, 1852, Sept. 10. Educated in country schools, living on a farm in early life; he removed to Sioux City, Iowa, 1882. In 1894 he was appointed United States minister to the Argentine Republic; in 1903 he was appointed United States minister to the republic of Panama. As arbitrator he fixed the boundary lines between Argentina and Chili between latitudes 23° and 26° 52′ 45″ w. He was director-general of the Pan-American Exposition at Buffalo in 1901.

BUCHANITES, *bŭch'an-īts:* extraordinary sect of fanatics, which sprang up in the w. of Scotland 1783; now extinct. The founder of the sect was Mrs. or Lucky Buchan, b. in Banffshire, 1738, of humble parentage; maiden name, Elspeth Simpson. She early fell into habits of vice, but with her licentiousness were combined an excitability of supposed religious feeling and extreme Antinomian opinions. In 1782, being resident in Glasgow with her husband, a potter, who ultimately divorced her, she became acquainted with the Rev. Hugh White, minister of the relief congregation in Irvine, a weak, vain man, and coarse, declamatory preacher, who adopted her opinions, for which he was deposed by his presbytery, and who began with her to found a new sect in Irvine. Popular tumults arose, which led to her expulsion from the town 1784, May. Mr. White and his wife, with other devoted adherents, male and female, accompanied her, regarding her as a divinely commissioned person, and expecting her to lead them to the place where Christ was speedily to appear again on earth; afterward they built for themselves, at New Cample, near Thornhill, a house of one apartment, with a loft, in which they all dwelt, supported chiefly by the money of the more wealthy of their number. A few additional persons joined them. Dissensions arose among them; and some left the society. Their expected heaven was one of mere sensual delights; and it is now ascertained that they lived in unrestrained sexual intercourse—for they condemned marriage as unworthy of Christians—and that they systematically practiced infanticide. Yet no investigation was made by the authorities. Those that remained of them purchased a small property, on which was built the first house of the village of Crocketford, where they finally became extinct, the last of them surviving till 1846, full of the strange delusions of his youth, and preserving in his house the bones of Lucky Buchan, which were

buried with him in his grave. See *The Buchanites from First to Last*, by Joseph Train. (Edin. 1846).

BUCHAN-NESS, *buch-an-nĕs':* the easternmost promontory of Scotland, in the n.e. of Aberdeenshire, three m. s. of Peterhead, in lat. 57° 28′ n., and long 1° 46′ w. A light-house, 130 ft. high, with a revolving light, has been erected here. It may be stated that the low rocks at Peterhead stretch a little further east than the Buchan-ness. In the sea off the Buchan-ness lie the Buchan Deeps, a great trough 50 to 90 fathoms deep, and 25 m. broad, and stretching south nearly as far as the Bell-rock. Outside lie the Long Forties, a bank at the depth of 35–45 fathoms, and 10–20 miles broad.

BUCHAREST, or BUKHAREST, or BUKHOREST, *bū-ka-rĕst':* the chief city of Wallachia, cap. of Rumania; in a rich and extensive plain on the Dumbovitza, a tributory of the Argish; lat. 44° 26′ n., long 26° 5′ e. The town is for the most part meanly built, but the streets are now mostly paved and lighted with gas. There are some handsome hotels; and the churches are numerous and many-spired, giving to the place a picturesque appearance. The royal palace was rebuilt 1885; and the Rom. Cath. cathedral is a fine building of 1875-84. The number of cafés and gambling tables is excessive; and altogether Bucharest has the unenviable reputation of being the most dissolute capital in Europe. The *corso*, or public promenade, is a miniature Hyde Park. Bucharest is the entrepôt for the trade between Turkey and Austria, the chief articles of commerce being grain, wool, salt, honey, wax, building-timber, and cattle. It has some small manufactures of woolen cloths and carpets. Bucharest has at various times suffered considerably at the hands of the Russians, and is notable as the place where, in 1812, a treaty was concluded between Turkey and Russia, by which the former ceded to the latter the province of Bessarabia and a portion of Moldavia; Russia waiving her claim to all other territories that she had conquered. This treaty also defined the Pruth as the boundary line between the two empires. During the Crimean campaign Bucharest was successively occupied by Russians, Turks, and Austrians. Pop. 282,071.

BUCHEZ, *bü-shā'*, PHILIPPE BENJAMIN JOSEPH: 1796–1865, Aug. 12; b. Matagne la Petite, dept. of Ardennes: French physician, writer, and pres. of the national assembly in 1848. He studied medicine in Paris 1815. He became involved in several plots against the Bourbons, was active in the conspiracy of the French Carbonari (q.v.), and supported the doctrines of St. Simon (q.v.); but after editing the communist journal, *Le Producteur*, he separated from his colleagues. During all his active career of underhand politics, he was prosecuting his learned studies, and 1825 published a *Précis Elémentaire d'Hygiène*, besides editing the

Journal des Progrès des Sciences et Institutions Médicales. After the revolution, 1830, Buchez established and conducted the journal *L'Européen*, the organ of Neo-Catholicism; and in concert with M. Roux Lavergne, began a republican history of the French revolution. All his writings are marked by original views and arguments for the belief in human progress. After the February revolution, 1848, B. was made pres. of the national assembly; but, by his want of energy during the disturbance of May 15, he incurred the censure of all parties. He died at Rhodez, in Aveyron.

BUCHHOLZ, *bôch'holtz*, REINHOLD: 1837–76; b. Frankfort, Germany: zoologist and traveller. He studied natural science, and accompanied the second German arctic expedition, 1869–70; made a voyage to prof. of zoology at Greifswald, 1872; made a voyage to the Cameroons Mountains, Fernando Po Island, and the Ogoway river, w. Africa, 1872–75. His accounts of his travels have been published.

BUCHNER, FRIEDRICH KARL CHRISTIAN LUDWIG, *frēd-rich kârl krēs'tĭ-ân lood-vĭg bûch'ner*, German physician and materialist philosopher: b. Darmstadt, 1824, March 29; d. Darmstadt, 1899, May 1. He studied at Giessen, Strasburg, Würzburg, and Vienna; became a lecturer at Tübingen University; and, in 1855, published *Kraft and Stoff* (14th ed. 1876; English translation, *Force and Matter* 1870), in which he attempted scientifically to establish a materialistic view of the universe. A violent controversy was raised; and Büchner saw himself compelled to resign his university post, and begin medical practice in Darmstadt. He wrote numerous contributions to periodicals on physiological and pathological subjects, as also in support of his atomistic philosophy; published in the latter department. *Natur und Geist* (1857); *Aus Natur und Wissenschaft* (1862–84); as well as works on Darwinism, the idea of God, the intelligence of animals, etc.; and translated Lyell's *Antiquity of Man* (1864).

BUCHNER, GEORG, *gā'ôrg*, German poet, brother of F. K. C. L. Büchner (q.v.): b. Goddleau, near Darmstadt, 1813, Oct. 17; d. Zurich, Switzerland, 1837, Feb. 19. In 1834, he entered the political arena with a manifesto entitled *The Rural Messenger* and bearing the motto: 'Peace to the cabin; war to the palace.' To escape arrest he fled to Strasburg, where he studied the philosophies of Descartes and Spinoza. He wrote a drama in 1834, on *The Death of Danton*, the work of a genuine but undisciplined poet. His *Complete Works*, with biography, was published in 1879.

BUCHNER, LUISE, *loo-ēz*, German poet and novelist, sister of Georg Büchner: b. 1821, June 12; d. Darmstadt 1877, Nov. 28. Her first publication, *Women and Their Calling* (1855), was followed by many others on the 'woman's rights question'; it commanded much

attention, and reached a fifth edition (1883). She wrote a volume of tales, *From Life* (1861); *Poet Voices of Home and Foreign Lands;* several original poems; *Woman's Heart;* some *Christmas Stories;* etc.

BÜCHNER, Max, German traveler and scientist: b. Hamburg, 1846, April 25. After serving as surgeon in the German army and navy, he traveled around the earth (1875), and spent some time in New Zealand. In 1878 he bore presents from the emperor to Muatiamvo, in the kingdom of Lunda, in equatorial Africa. After several vain attempts to break through toward the north, he returned to the coast. In 1884 he accompanied Nachtigal in founding the colonies of Togo and Kamerun, in western Africa, where he acted temporarily as representative of the German empire, fought the natives, and concluded treaties with chiefs in the interior. In 1888, as conservator of the Ethnographical Museum of Münich, he traveled in Australia, Guinea, and East Asia. He wrote *A Trip Through the Pacific Ocean* (1878); and *Kamerun* (1888).

BUCHON, Jean Alexandre, *zhŏn â-lĕks-ândr bû-shôn*, French historical writer: b. Ménetou-Salon, 1791, May 21; d. 1846, April 30. Having gone to Paris, he became collaborateur on several liberal journals, and early took part in the opposition to the restoration. He was in consequence several times prosecuted by the government, and his writings, such as his *Vie de Tasse* (1817), were interdicted. In 1821 he gave a course of lectures in the Athenæum on the history of dramatic art in England; and in the following years he traveled over the greater part of Europe for the purpose of collecting documents to illustrate the history of France during the Middle Ages. After his return he published his *Collection des Chroniques Nationales Françaises, écrites en Langue Vulgaire du XIIIme au XVI me Siècle* (47 vols. 1824–9), which he began with the *Chroniques de Froissart* (15 vols. 1824–6). He was appointed inspector of the archives and libraries of France in 1828, and in 1829 inspector-general of the departmental and communal archives; but soon lost his office through a change of ministry. In addition to the works of this indefatigable writer already mentioned, may be named his *Historie Populaire des Français* (1832); *La Grèce Continentale et la Morée* (1843); *Histoire des Conquetes et de l'Etablissement des Français dans les Etats de l'ancienne Grèce sous les Ville-Hardouin* (1846); besides his editions of Brantome, etc., and his articles in cyclopedias and magazines.

BUCHTEL, *bûk'tĕl*, Henry Augustus, American clergyman and educator: b. Akron, Ohio, 1847, Sept. 30. He was educated at Asbury (now De Pauw) University, entered the Methodist ministry, and held pastorates in various parts of Indiana, as well as in New York, New Jersey, and Colorado. From 1900–6

he was chancellor of the University of Denver, in the latter year being elected governor of Colorado.

BUCHU: see BUCKU.

BUCK, n. *bŭk* [AS. *bucca;* W. *bwch;* F. *bouc*—probably from the tendency of the animal to but or strike with the forehead; Icel *bukkr,* a he-goat: Gael. *boc,* a he-goat, a knock or a blow]: distinctively applied to the male of the fallow deer (the female being *Roe*); but often also to the male of other species of deer, as of the ROEBUCK (q.v.), though not to that of the Red Deer (see DEER), the mature male of which is a STAG or a HART: it is applied also to the male of the goat, the rabbit, etc.; a fop; a dashing young fellow; in the United States an adult negro or Indian. BUCK'-ING, n. the copulation of bucks and does. BUCK'-ISH, a foppish. BUCKSKIN, n. a kind of leather; a heavy woolen cloth. BUCK'BEAN [Dan, *bukke-blad,* goat-leaf]: a water-plant having leaves like a bean, also called marsh trefoil, and bog-bean; the *Menyăn'thēs trĭfolĭāta;* ord. *Gentĭănĕæ,* used as a substitute for gentian. BUCK-SHOT [so named from their size and color]: the seeds of *Cannas,* round and black, or the ord. *Marantācĕæ* or *Cannācĕæ;* known also as *Indian shot;* a kind of leaden shot larger than swan-shot. About 160 or 170 of them weigh a pound. BUCK-TOOTH, a displaced and projecting front tooth, especially in a horse. *Note.*—Latham suggests that *buck,* a dandy, may be only a corrupt pronunciation of F. *beaux;* we have, however, Icel. *bokki,* a dandy.

BUCK, v. *bŭk:* expressing the action of a horse as, after springing from the ground, it comes down with fore legs stiff and unseats the rider. [Colloq. U. S.]: to resist stubbornly.

BUCK, n. [U. S.]: a saw-horse. BUCK-SAW, n.: a saw set in a frame, and worked with both hands.

BUCK, n. *bŭk* [Gael. *bog,* moist, to steep or soak; *buac,* the dung used in bleaching; Bret. *bouk,* soft: Dan. *bög-aske,* the ashes of beech-wood]: lye or suds in which clothes are bleached or washed: V. to wash or steep clothes in lye. BUCK'ING, imp.: N. the act or process of washing clothes; in *mining,* crushing ore. BUCKED, pp. *bŭkt.* BUCK-BASKET, a basket employed to carry clothes in to the washing-house.

BUCK, CARL DARLING, American philologist: b. Bucksport, Me., 1866, Oct. 2. He graduated from Yale in 1886; took the degree of Ph.D. there in 1889; and was a member of the American School of Classical Studies at Athens in 1887–9. In 1892, he became professor of Sanskrit and comparative philology at the University of Chicago. He has written *Vocalismus der Oskischen Sprache; Discoveries in the Attic Deme of Ikaria* (in *Papers of the American School of Classical Study, Athens,* Vol V.); *The Oscan-Umbrian Verb*

System; Latin Grammar (with W. G. Hale); and several papers in the *American Journal of Philology*. He has also written *Grammar of Oscan and Umbrian* (1904); *Sketch of the Linguistic Conditions in Chicago* (1903).

BUCK, Dudley, American organist and composer: b. Hartford, Conn., 1839, March 10. After musical study at home and in Leipsic, whence he returned in 1862, he became organist at Park Church, Hartford, and successively at St. James' Church, Chicago, Music Hall, Boston, and St. Ann's Church, Church of the Holy Trinity, and Plymouth Church, Brooklyn. He retired in 1903. Besides his musical work he has written several books: *A Dictionary of Musical Terms;* a work on *The Influence of the Organ in History* (1882), etc. The *Centennial Cantata*, for the opening of the Exposition of 1876, by appointment of the U. S. Centennial Commission, the *Forty-sixth Psalm*, the *Legend of Don Munio*, the *Golden Legend*, and the *Marmion* symphonic overture, are among his larger works with orchestra. He has also composed chamber music, songs, and male-voice pieces. Among his later works may likewise be mentioned *The Voyage of Columbus, The Light of Asia, The Christian Year*, and *Deseret*, a comic opera.

BUCK, Jirah Dewey, American physician and theosophist: b. Fredonia, N. Y., 1838. He graduated in 1864 from the Cleveland Homœopathic College, became professor in that institution and later settled in practice in Cincinnati. He was afterward made professor of therapeutics in the Pulte Medical College. He is well-known for his theosophical studies and has been elected president of the Theosophical Society in America. Among his works are *The Nature and Aims of Theosophy; A Study of Man and the Way to Health; Mystic Masonry; Browning's Paracelsus and Other Essays; Why I Am a Theosophist.*

BUCKBEAN, or Marsh Trefoil *(Menyanthes trifoliata):* plant of the nat. ord. *Gentianeæ* (q.v.), the only known species of its genus; widely distributed in all of the colder parts of the northern hemisphere. It is one of the most beautiful of plants. It grows in marshy places, its creeping root-stalks (or rhizomes) and densely-matted roots often rendering boggy ground firm. The leaves are trenate, like those of the trefoils or clovers, and are supported on long stalks. The flower-stalk bears a compound raceme of 10–20 white flowers, externally tipped with red. The calyx is 5-parted; the corolla funnel-shaped, with a spreading 5-lobed limb, shaggy on the inner surface, with thick fleshy hairs. The fruit is a one-celled, two-valved capsule. The leaves are destitute of smell, but very bitter. From them is prepared a valuable bitter extract long used in dyspepsia and disorders of the bowels, and

formerly in intermittent fevers. An infusion is also sometimes used, and sometimes the dried and powdered leaves. The whole plant seems to possesses the same bitter and tonic properties. It is sometimes used instead of hops.

BUCKBOARD, n. *bŏk'bōrd:* a light four-wheeled vehicle, with long springy board instead of springs.

BUCKET, n. *bŭk'kĕt* [F. *baquet* a pail—from *bac*, a punt, a trough: prov. Ger. *buck*, a boat: Gael. *bucaid*, a bucket: Russ. *buk*, a washing-vessel]: a domestic vessel of various shapes for containing water, rubbish, or ashes; a pail used by sailors. BUCK'ETFUL, n. a quantity sufficient to fill a bucket. BUCK'ETFULS, n. plu. *Note.*—In such compounds, *bucketfuls* is the true plural; *buckets-ful* has a slightly different sense, and is simply the n. *bucket* qualified by the adj. *full.*

BUCK'ET-SHOP (originally a liquor-shop whose customers took liquor away in small pails): office ostensibly for conducting a stock-exchange business; really for registering bets on the fluctuations of the stock-market.

BUCK'EYE: see HORSE-CHESTNUT.

BUCK'HOUND: a hunting-dog formerly common in Britain, when buck-hunting was a most fashionable amusement, but of which few packs now exist. The B. resembles a dwarf STAG-HOUND (q.v.), and possesses great strength and perseverance. Bucks are hunted often by other kinds of hounds.

BUCKIE, n. *bŭk'kĭ* [AS. *bugan;* Meso-Goth. *biugan;* Dan. *buigen*, to bow, to bend]: in *Scot.*, any spiral shell of a sea-snail. THRAWN or DEIL'S BUCKIE, one with an imperfection or twist in his character; one perverse or refractory; a devil's plaything.

BUCKINGHAM: old county town of Buckinghamshire, Eng., in the n. part of the shire; 61 m. n.w. of London, on the Ouse—which flows round the town, and has three bridges. Bobbin lace is the chief manufacture, but it is on the decline. Buckingham is a place of considerable antiquity. Edward the Elder fortified it 978, and the Danes captured it 1010. The Earls of Buckingham built a castle here soon after the Norman conquest. Edward III. made it a staple for wool. Here Catharine of Aragon received the news of the battle of Flodden, and Charles I. had his headquarters in Buckingham for a few days in 1644. Pop. 3,500.

BUCKINGHAM, *bŭk'ing-am*, Duke of (GEORGE VILLIERS), favorite of James I. and Charles I. of England: 1592, Aug. 20—1628, Aug. 23; third son of Sir George Villiers. He was born at his father's seat of Brookesby, Leicestershire. Knighted 1616, Apr. and sworn a gentleman of the bedchamber 1617, Jan. 1, he became Master of the Horse and a Knight of the Garter. Created

the same year Baron of Whaddon and Viscount Villiers, and in January following Earl of Buckingham, and sworn of the privy council, he was next made a marquis, and appointed Lord-admiral of England, Chief-justice in Eyre of parks and forests south of the Trent, Master of the King's Bench Office, High Steward of Westminster, and Constable of Windsor Castle. In 1620, he married the daughter of the Earl of Rutland, the richest heiress in the kingdom. In 1623, while negotiations were in progress with the Spanish court for a marriage between the Infanta and the Prince of Wales, afterward Charles I., Buckingham persuaded the latter to go himself to Madrid and prosecute his suit in person. The ultimate failure of the negotiations has been ascribed to Buckingham's arrogance. In his absence he was created a duke, and on his return nominated Lord-Warden of the Cinque Ports, and Steward of the Manor of Hampton Court. By his advice, James declared war against Spain. On the accession of Charles I., 1625, Buckingham maintained his ascendency at court but after the ill-fated expedition against Cadiz, he became odious to the nation, and was saved from impeachment only by the king's dissolving parliament. The treaty for the marriage of Charles with the Princess Henrietta of France was concluded by him, but he was not allowed to return to Paris, in consequence of his audacity in lifting his eyes to the French queen. In 1627, with an armament of 100 sail and 7,000 soldiers, he appeared before Rochelle, then in possession of the Huguenots, who refused him admission within the harbor. His troops then made an ill-conducted descent on the neighboring Isle of Rhé, and returned to England beaten and disgraced. He soon undertook a second expedition to Rochelle, and proceeded to Portsmouth for embarkation, when he was assassinated by a discontented subaltern-officer named Felton, in his 36th year.

BUCKINGHAM, 2d Duke of (George Villiers): brilliant but profligate nobleman: 1627, Jan. 30—1688, Apr. 16; b. Wallingford House, Westminster; son of the first duke. He studied at Cambridge. On the outbreak of the civil wars, he served in the royal army; his estates were confiscated by the parliament, and he took refuge on the continent. He attended Charles II. into Scotland, and after the battle of Worcester, 1651, went again into exile. Returning secretly into England he married, 1657, the daughter of Lord Fairfax, the parliamentary general, to whom his forfeited estates had been assigned. Arrested by Cromwell and committed to the Tower, he was afterward removed to Windsor Castle, but released on the abdication of Richard Cromwell. At the restoration, he recovered his estates and was made master of the horse and sworn of the privy council. He was mainly instrumental in the fall of the chancellor, Clarendon, whom he made an

object of ridicule to the king, and was one of Charles's confidential ministers, who, from the initial letters of their titles were called 'the Cabal.' Engaging, in 1666, in some treasonable practices for effecting a change in the government, he was deprived of all his offices at court, but, on his submission, soon recovered them. In 1670, he was sent ambassador to France, and was employed on other embassies. He was elected chancellor of the Univ. of Cambridge 1671. Supporting the nonconformists 1674, he opposed the test act, and was deeply engaged in the Popish plot. After Charles's death, 1865, Buckingham retired to his manor of Helmsley, Yorkshire, and amused himself with the chase. He died at Kirkby-Moorside, and was interred in Westminster Abbey. The manufacture of glass and crystal is said to have been introduced into England from Venice by him. Buckingham was the author of several stage-plays, of which the best is *The Rehearsal*, a comedy; *A Satire against Mankind;* and some poems.

BUCKINGHAM, James Silk: traveller and lecturer: 1786–1855, June 30; b. Flushing, near Falmouth, Cornwall, Eng.; son of a farmer. When a boy, he went to sea, and made several voyages to Lisbon. After years of unsettled and wandering life, he, 1816, established a journal at Calcutta but the boldness of his censures on the Indian government led to his expulsion from the presidency of Bengal. His lectures, on his return to England, against the East India Company monopoly, and in support of opening the trade to China, directed public attention to the subject. In London he established *The Oriental Herald* and *The Athenæum*, now the leading weekly literary journal. Subsequently, he travelled through the United States, and in 1832–37 was M. P. for Sheffield. He was projector and sec. of the British and Foreign Institute, literary club, 1843–46, and pres. of the London Temperance League, 1851. Buckingham was the author of numerous works on travel on the continent, in the East, and in America. He was engaged on his autobiography, two vols. of which were published before his death.

BUCKINGHAM, *bŭk'ing-am*, Joseph Tinker: 1779–1861; b. Conn.; journalist; son of Nehemiah Tinker. At the age of 27 years, he obtained authority from the legislature of Mass. to assume his mother's name, Buckingham. His father died 1783, leaving a widow and 10 children in destitution. Buckingham learned the printer's trade; and edited *The New England Galaxy* (1817–28); *The Boston Courier* (1824–48); *The New England Magazine* (1832–36). He served also in the legislature; and published *Personal Memoirs and Recollections of Editorial Life* (1850, 2 vols.); and other works.

BUCKINGHAM, William Alfred, LL.D.: 1804–75; b. Lebanon, Conn.; statesman. He spent his boyhood

on the farm; and received a common-school education. At the age of 21 years he started a prosperous business at Norwich, of which city he was mayor for four years. From 1858–66, he was gov. of Connecticut. He was enthusiastic and energetic in his efforts to save the Union, being largely instrumental in getting some 55,000 volunteers for the union army; so that without resorting to a draft, his state furnished 6,000 men more than her quota. He is known as one of the great 'war governors' of that critical time. He was U. S. senator from 1868 until his death. Senator Buckingham made a gift of $25,000 to the theological school of Yale College.

BUCK'INGHAMSHIRE: a south-midland county of England; greatest length about 54 m., its average breadth 18; 738 sq. m. The plastic clay tertiary strata occupy the s. parts of the county, which is finely diversified with hill and dale, wood and water. To the north is a broad chalk-land, including the Chiltern range of chalk-hills, which enter from Oxfordshire, and stretch across the county n.e. into Bedfordshire, partly covered with heath and wood, and near Ivinghoe and Wendover, about 900 ft. high. Sloping n. from these hills, and crossed by narrower bands of greensand and oolite, is the extensive and very fertile vale of Aylesbury, watered by the Thame. The chief rivers are the Thames, bordering the county on the s.w., the Ouse, Ousel, Colne, and Thame, the latter two falling into the Thames. The Grand Junction canal, and the Great Western and Northwestern railways intersect the county on the e. and s. The climate of Bucks is mild and healthy; the soil is mostly good, chalk and clay predominating. About half the county is under tillage, the rest in meadows and pasture. The agriculture is not equal to the capabilities of the land, which is often overcropped and exhausted. The farms are generally small, averaging 200 acres. The cottages are generally good. Wheat and beans are the principal crops. The chief dairy product is butter, of which four to five millions of pounds are annually sold, chiefly in London. In the vale of Aylesbury, fattening of cattle is extensively carried on; the sheep are noted for their fine and heavy fleeces; and large numbers of ducks are reared for metropolitan consumption. Of the total area of 467,132 acres, 405,899 were cultivated in 1900, 50,391 being under wheat crops. Beech and oak are the chief timber-trees, but box and juniper are also grown. The chief manufactures are paper, straw-plait, and thread-lace. The county returns three members to parliament. Aylesbury, Buckingham, Marlow, and Wycombe ceased in 1885 to be parliamentary boroughs. B. contains some Roman and British remains, as traces of Watling, Ickneld, and Akemen streets or ways. The chief ecclesiastical ruins are those of Missenden and

Notley Abbey, the latter of which has been converted into farm-buildings. There are many examples of early English and decorated architecture. The church of Chetwode, near Buckingham (13th c.), contains some very fine examples of ancient glass-staining. Many events of historical interest occurred in this county. It was the scene of contest in the civil wars of Stephen and John. At Chalfont St. Giles, Milton finished his *Paradise Lost*, and at Horton, he wrote *L'Allegro*. At Hampton lived the great patriot of that name; Atterbury was born at Milton; Stoke Poges churchyard suggested Gray's *Elegy*, and is the place of his burial; at Olney, Cowper lived; Beaconsfield Manor was the seat of Waller; Gregories, near Beaconsfield, of Edmund Burke; Bradenham, of the elder D'Israeli; and Hughenden, of the Earl of Beaconsfield; Scott, the biblical commentator, was rector of Aston Sandford; Herschel's great telescope was erected at Slough, where he made most of his important discoveries and at Stowe is a magnificent mansion—one of the finest in England, alike for extent, architecture, and beauty of site. Pop. (1901) 196,844.

BUCKLAND, Francis Trevelyan: 1826, Dec. 17—1880, Dec. 19; b. at Christ Church College, Oxford, Eng.; son of the Rev. Dr. William Buckland (q.v.). He was educated at Winchester School, and at Christ Church College, Oxford. He studied medicine, and after being house-surgeon of St. George's Hospital, London, was appointed asst. surgeon to the 2d Life-guards 1854, retiring 1863. From his boyhood, he had enthusiastic delight in natural history, especially when it could be applied practically to the cultivation of useful quadrupeds, birds, or fish, in which study he was encouraged and guided by his father. He contributed largely to the *Times*, *Field*, *Queen*, *Land and Water*, which he started with Mr. W. Pfennell, and of which he was editor, etc. He was also the author of *Curiosities of Natural History* (1857; 2d series, 1860; 3d series, 1866); *Fish-hatching* (1863); *Logbook of a Fisherman and Zoologist* (1876); *Natural History of British Fishes* (1881); *and Notes and Jottings from Animal Life* (1882); also editor of a new edition of his father's Bridgewater Treatise (1858); and of *White's Selborne* (1876). Buckland was first sec. of the Acclimatization Soc. He was an acute observer, and his writings on natural history in greap part present in a sprightly and interesting style the results of fresh and original observations. His advice on fish-culture was sought by the governments of Russia, Germany, France, America, and the colonies. He also, at his own cost, established under the Science and Art Dept., South Kensington, a 'Museum of Economic Fish-culture.' In 1867, Buckland was appointed inspector of salmon fisheries for England and Wales; in 1870, special commissioner

on the salmon fisheries of Scotland; and in 1877, on the Scotch herring fisheries. He was not a follower of the Darwinian school of naturalists. See his *Life*, by G. C. Bompas (1885).

BUCKLAND, WILLIAM, D.D., Dean of Westminster: 1784—1856, Aug. 14; b. Axminster, Devonshire, Eng.: distinguished geologist. Educated at Winchester and Oxford, he was appointed, 1813, reader in mineralogy in Oxford Univ. The same year, he was elected a fellow of the Geological Soc., and he was twice its president. In 1818, he became reader in geology at Oxford, and was elected fellow of the Royal Soc. In 1822, he received the Copley medal for an account of an assemblage of fossil teeth and bones of 22 different animals, discovered in a cave at Kirkdale, Yorkshire; and in 1823, he published a treatise founded on it, entitled *Reliquiæ Diluvianæ, or Observations on Organic Remains, attesting the Action of a Universal Deluge*, a theory which he afterward saw cause to modify. In 1825, Buckland was appointed a canon of Christ Church, Oxford. In 1827, he was chosen a member of the council of the Royal Soc.; in 1832, he was elected pres. of the British Assoc. at Oxford, its second meeting; and in 1836, he published his Bridgwater Treatise, *Geology and Mineralogy considered with Reference to Natural Theology* (2 vols. 8vo). To the Transactions of the Geological Soc. he contributed many valuable papers; and his sketch of the structure of the Alps, in the *Annals of Philosophy*, is esteemed one of the most interesting of his geological writings. In 1845, he was made Dean of Westminster, and in 1847 a trustee of the British Museum. Under his great and continuous labors his mental faculties gave way some years before his death.

BUCKLANDIA, *bŭk-lăn'dĭ-a:* magnificent and beautiful evergreen tree of the nat. ord. *Hamamelide* (see WITCH-HAZEL): native of mountains. It grows unbranched to the height of 40 ft., the trunk sometimes 21 ft. in girth at 5 ft. from the ground. The foliage is thick, bright, and glossy. The timber is not valuable. Dr. Hooker thinks that this tree would probably thrive in the mild climate of the w. of England.

BUCKLE, n. *bŭk'kl* [F. *boucle*, a curl or buckle: OF. *bocle*, boss of a shield—from mid. L. *buc'ŭla*, a shield, as made of hide, originally, the *boss*—from L. *bucca*, the mouth: Ger. *buckel*, a boss or stud]: an article usually of metal, consisting of a rim and tongue, used for fastening together parts of dress; formerly a conspicuous ornamental fastener for the upper of a shoe; a curl: V. to fasten with a buckle; in *OE.*, to bend or bow; to encounter. BUCK'LING, imp.: ADJ. curly; wavy. BUCK'LED, pp. *bŭk'kld.* To BUCKLE TO, to engage in a matter with zeal. See BUCKLES.

BUCKLE, *bŭk'l*, HENRY THOMAS: 1821, Nov. 24—1862, May; b. Lee, Kent., Eng.: author. He was for a very short time at Dr. Holloway's school in Kentish-Town, near London. No other school and no university claims credit for his education, which nevertheless was in a high degree liberal. An easy fortune, and a large library, enabled Mr. Buckle to gratify, without impediment or restraint, an absorbing love of letters. He became suddenly notable, 1857, by the publication of the first vol. of his work, *History of Civilization in England.* After bringing out a second vol., 1861, he undertook a journey to the East to restore his health and extend his knowledge. Having spent the winter in Egypt, he went over the desert to Syria, caught typhus fever by the way, and died at Damascus.

Buckle's plan involved, before tracing the particular history of English civilization, a general consideration of the progress of those European countries, England, France, Germany, Scotland, Spain, and America, in which the elements of modern civilization are originally found. The two volumes published are occupied with this preliminary examination, which they do not complete. His objects, however, are clear. They are (1) to discover what is the essential spirit of a nation's history apart from particular men and events, and (2) to trace out the causes of the progress which has been made in England and France. Under the first head, Buckle endeavors to show that the spirit or character of a people is dependent on material circumstances, such as soil, climate, food, aspect of nature, and the like, and to be sought for in these; under the second head occurs the theory, the vigorous application of which by Buckle has started and offended many readers—viz., that the progress of society depends upon skepticism; that the retarding force is credulity; and that the excessive 'protection' exercised by governments, the nobility, the church, etc., over the 'people,' has dwarfed and held back the spirit of freedom and civilization. These, and other positions, are defended by Buckle with great ingenuity and lucidity of argument and expression, and have been admitted, even by his opponents, to contain much truth. He is accused—perhaps not unjustly—of being often one-sided, and of drawing sweeping deductions from an imperfect survey of the facts. He is said to have been one of the best chess-players in the world. See his *Miscellaneous and Posthumous Works*, edited by Miss Helen Taylor; and the *Life and Writings of Buckle*, by A. H. Huth (1880).

BUCKLER, n.: *bŭk'lėr* [F. *bouclier;* O.F. *bocler*, a shield with a central boss—from *boucle;* OF. *bocle*, a shield's boss, a ring—(see BUCKLE)]: in old armor, a kind of shield buckled on the left arm. The bucklers worn by the *hastati*, or spearmen, among the ancient

Romans, were about 4 ft.: long, by 2½ in width, made of boards, covered on the inside with linen and sheepskin, and on the outside with iron-plate. In the middle ages, the B. was round, oval, or square in shape, and was frequently made of wicker-work or of hide, strengthened by metal plates. V. to defend; to support. BUCK'LERS, n. plu. *-lerz* among *sailors*, blocks of wood for stopping up the hawse-holes when at sea.

BUCKLEY, JAMES MONROE, D.D., LL.D.: Methodist clergyman; editor of *Christian Advocate;* b. Rahway, N. J., 1836, Dec. 16; son of the Rev. John Buckley, a native of England, his mother being the daughter of Judge Clayton Monroe of Mount Holly, N. J.; prepared for college at Pennington (N. J.) Seminary; was a member of the class of 1860 in Wesleyan University, but owing to impaired health was not graduated with the class, but pursued studies of the curriculum under private teachers. Was admitted to membership in the New Hampshire Conference of the Meth. Episc. Ch. in 1859; while filling pastorates in that State he carried on special studies in theology and ecclesiastical history and law. In 1863 he travelled in Europe, and on returning became pastor in Detroit, Mich.; in 1866 became pastor in Brooklyn, N. Y., and afterwards in Stamford, Conn. In 1880 he was elected editor of the *Christian Advocate,* and has been successively re-elected once in four years to the present time. In 1872 he was elected a member of the General Conference of the Meth. Epis. Ch., and has been elected to that body for each session since that date. Was president of the board of managers of the State Epileptic Village of New Jersey from its foundation until three years ago, when he resigned; member of the board of managers of State Hospital for the Insane at Trenton, N. J., for 5 years, and for 13 years has been a member of the board of managers of the State Hospital for the Insane at Morris Plains, N. J.; has been president of the board of managers of the Methodist Episcopal (Seney) General Hospital, Brooklyn, N. Y., from its foundation. Author of *Christians and the Theatre; Supposed Miracles; Oats versus Wild Oats; or, Common Sense for Young Men; The Midnight Sun, the Czar and the Nihilist; Faith Healing, Christian Science and Kindred Phenomena; Travels in Three Continents; History of Methodism in the U. S.; Extemporaneous Oratory for Professional and Amateur Speakers; The Fundamentals of Religion and their Contrasts.*

BUCKNER, SIMON BOLIVAR: 1823— ————; b. Ky.; confederate general. He graduated at West Point 1844, became prof. of ethics there 1846; and was asst. instructor of infantry tactics 1848–55. Afterward he practised law. He joined the confederate army, and was in command of Fort Donelson at its surrender to Gen. Grant, 1862, Feb. 16. He was imprisoned at Bos-

ton, and after his exchange fought at Murfreesboro and Chickamauga. He was elected gov. of Ky. 1887; was nominated for vice-pres. 1896 by the sound-money Democrats, but defeated.

BUCKRAM, n. *bŭk'răm* [OF. *bougran* and *boucaran*, a coarse open cloth—from *bouc*, a he-goat—from mid. L. *bouqueran'nus*, a fine texture of cloth: It. *bucherame*, a coarse cloth]: *originally*, a stuff made of goat's hair; coarse linen cloth stiffened with glue: ADJ. stiff; precise.

BUCKS (Eng.): see BUCKINGHAMSHIRE.

BUCKSHOT WAR: 1838, a disputed-election case in Pennsylvania, of national importance as bearing on the nature of the 'domestic violence,' from which the Constitution requires the Federal government to protect the States. As usual, fraud under legal forms was met by retaliation in defiance of them. The legislature that year had to elect a United States senator; and the return of Democratic candidates in Philadelphia gave that party a majority on joint ballot, though the Senate was 22 Whig (Anti-Masonic) to 11 Democratic. But the Democratic congressional candidate in one of the city districts was defeated; his party charged it to frauds in the Northern Liberties district (now in Philadelphia), and the 10 Democratic election judges threw out its entire vote of some 5,000, giving him the certificate of election. At once the seven Whig judges met and gave the certificate not only to their candidate, but to their legislative candidates who were not elected even with the Northern Liberties vote: obviously to fight till their congressman was restored. The secretary of State was chairman of the Whig State committee, received the Whig certificate first (professedly at least), refused to acknowledge any others, and publicly advised his party to claim the election and hold out. Armed crowds of both parties collected at Harrisburg 'to see fair play' when the legislature met Dec. 4, and for some days the sessions were held with a roaring mob outside. The Whig returns alone were handed in by the secretary of State; the Whig senate organized, and then adjourned on account of the mob; one member is alleged to have threatened them with 'ball and buckshot,' whence the name. In the Representatives' hall both parties organized and chose speakers, the Whigs, T. S. Cunningham, and the Democrats, William Hopkins; the former then adjourned, whereupon the latter held the hall with a guard and the Whigs had to meet outside. The Whig governor, Joseph Ritner, called on the State militia to be ready to rescue the capital from a 'lawless mob,' and appealed to the commandant, at Carlisle, and next to President Van Buren, for help against 'domestic violence,' which was refused on the ground that this phrase referred only to insurrection against lawful

authorities, whereas this was only a political struggle to determine who the lawful authorities were, in which the government could not decently interfere. About 1,000 militia were brought to Harrisburg; but after a fortnight's stay departed, as the city was entirely quiet, and the rival houses holding regular sessions. The cooler Whigs, however, saw that the secretary of State could not justify his assumption of power; enough Cunningham members joined the Hopkins House to give it a majority, and on the 25th the senate acknowledged it as the true one, whereupon the other broke up and its members gradually drifted in—all but Thaddeus Stevens (q.v.), who would not take his seat during the session. The legislature elected as senator Daniel Sturgeon, then State treasurer, who as such refused to honor Ritner's bill for the employment of the militia.

BUCKSKIN: a fanciful name for a heavy-made, strong-twilled woolen fabric, for trouserings—highly milled to about the usual width for such goods—27 inches; and cropped and finished, with the pile or nap so shorn as to show the texture through it. Buckskin (properly) is the name for a kind of leather.

BUCKSTONE, John Baldwin: 1802–1879, Oct. 31: b. in the suburbs of London: comedian and dramatic writer. He appeared first on the stage of a provincial town; then in London at the Surrey Theatre 1823, with such success that he was soon engaged at the Adelphi Theatre, where he continued many years as leading low comedian. He afterward played at the Haymarket and Drury Lane Theatres, of the former of which he was lessee from 1853–78. Buckstone's acting was noted for comicality and humor, which never degenerated into vulgarity, and for its distinct appreciation of individual traits. Of the 150 pieces which he is said to have written for the stage, the best known are: *The Green Bushes, The Flowers of the Forest, Luke the Laborer, The Wreck Ashore, The Rough Diamond, Good for Nothing, The Irish Lion,* and *The Alarming Sacrifice.*

BUCKTHORN, n. *bŭk'thawrn* [AS. *bucca;* Icel. *bukkr;* Dut. *bok,* a he-goat], *(Rhamnus)*: genus of shrubs or small trees of the nat. ord. *Rhamnaceæ* (q.v.), distinguished by a bell-shaped 4–5-cleft calyx, which divides around the middle after flowering, the upper part falling away, and the base remaining and adhering to the fruit; which is globose, and sometimes succulent, sometimes rather dry or spongy, with 2–4 stones. The petals are sometimes lacking. Some of the species are dicœcious, some hermaphrodite. They are numerous, and natives of most of the tropical and temperate regions of the world.—The Common Buckthorn *(R. catharticus)* is a deciduous shrub or low tree, frequent in England and in other parts of Europe and the north of Asia. The leaves are ovate, cre-

nate, and bright green; the branches spiny; the flowers small, yellowish-green, and densely clustered; male and female flowers on separate plants; the berries about the size of peas, globular, bluish-black, nauseous, and violently purgative. They were formerly much used in medicine, but now more rarely, and only in the form of a syrup prepared from their juice. They supply the *Sap Green* (q.v.) or Bladder Green of painters. The bark affords a beautiful yellow dye. The Buckthorn is sometimes planted for hedges, but is of too straggling a habit.—The ALDER BUCKTHORN, or BERRY-BEARING ALDER *(R. frangula)*, is frequent in woods and thickets throughout Europe. It is a shrub, rarely a small tree, with spineless branches, oval entire leaves, and small, whitish, axillary flowers, which are in general somewhat clustered. The bark of the twigs is gray, and has a disgusting smell and a nauseous bitter taste. It was formerly used in medicine, with that of the last species, and has recently been recommended in many quarters as a remedy for intermittent fevers. It contains principally an acrid bitter extractive, a volatile oil containing hydrocyanic acid, and a yellow coloring matter called *Rhamnin*. The berries are small and black, and violently purgative. It is objected to their use in medicine that much sickness and thirst attend it. The charcoal of the wood is light, and is used for the preparation of gunpowder. The bark, leaves, and berries are used for dyeing; the bark for dyeing yellow, and with preparations of iron, black; the unripe berries to dye wool green and yellow; the ripe berries to dye it bluish-gray, blue, and green. The flowers are peculiarly grateful to bees.—DYER'S BUCKTHORN *(R. infectorius)* is a low shrub, abundant in the s. of Europe, whose unripe fruit yields a brilliant yellow dye. The berries and inner bark of *R. tinctorius*, native of Hungary, also are used in dyeing; and the berries of *R. saxatilis*, a procumbent shrub, growing among rocks as far n. as Switzerland. The *French Berries*, *Avignon Berries*, or *Yellow Berries* of dyers, are the fruit of *R. infectorius*, *R. saxatilis*, *R. amygdalina* (or *oleoides*) and *R. Clusii*.—The SEA BUCKTHORN is a shrub of a different genus and order. See SALLOW-THORN. *Rhamnus Purshina*, *R. Californica* and *R. crocea* are common in the western parts of the U. S. The first is occasional throughout the colder parts of the U. S. *R. alnifalia* occurs in the South. The first is the caseara of medicine, one of the most powerful of cathartics, also called chittim wood, sacred bark, etc. The bark is very bitter and the black cherry-like berries also. This is a tall shrub 15 to 20 ft. high with the habit of the choke cherry. For the medicinal character see CASCARA. There are about 70 species of Rhamnus, few of them in the U. S.

BUCKU, *bū'kû:* name common to several small

shrubs of the genus *Barosma* (formerly included in *Diosma*), natives of the Cape of Good Hope, the leaves of which are used in medicine—sometimes in the form of a powder, more generally of an infusion or a tincture—particularly on account of their powerful operation on the urinary organs, as in chronic inflammation of the bladder, urinary calculus, etc. They are used also in dyspepsia, rheumatism, and dropsy; and are stimulant and antispasmodic, diuretic, diaphoretic, and tonic. They appear in commerce usually mixed with stalks and fruit. They are smooth, leathery, and shining, more or less crenated or serrated, and much covered with pellucid dots, which are glands filled with a strongly-smelling yellowish volatile oil. The strong odor of Bucku leaves is generally regarded as disagreeable, but the Hottentots perfume themselves with them. They have a warm taste, resembling that of mint. The genus *Barosma* belongs to the nat. ord. *Rutaceæ*, and is distinguished by regular flowers with five petals, five fertile, and five abortive scale-like stamens, anthers bearing a minute terminal gland, and a five-lobed ovary. The species principally yielding the Bucku leaves of the shops are *B. serratifolia*, *B. crenata*, *B. crenulata*, and *B. venusta*. Also spelled BUCHU.

BUCKWHEAT, n. *bŭk'whēt* [Dan. *bog-hvete;* Dut. *boekweit;* Ger. *buchweizen—lit., beech-wheat*, and so named from the resemblance of its seeds to *beech*-mast: Ger. *buche;* Dan. *bog*, beech-mast] *(Fagopyrum):* genus of plants of the nat. ord. *Polygoneæ* (q.v.), or according to many botanists, a subgenus of *Polygonum*, distinguished by the central embryo, and by racemes of flowers grouped in panicles. COMMON B. *(Fagopyrum esculentum*, or *Polygonum Fagopyrum)* is a native of the basin of the Volga, the shores of the Caspian Sea, and many parts of central Asia, from which it is said to have been introduced by the Moors into Spain, and thence to have extended over Europe, in many parts of which places it is now naturalized. Another account represents it as brought to Europe by the Crusaders. In France it is called *Blé Sarrasin*, or Saracen wheat. It is cultivated on account of the farinaceous albumen of the seeds, which are used, as grain, for food of man and cattle. It is upright, branched 1–3 ft. in height; the leaves are between heart-shaped and arrow-shaped, the flowers pale red, the seed (nut) black and triangular, the angles even (not toothed). Buckwheat is a very common crop in the United States and in some parts of Europe; but is seldom sown in Britain, except as food for pheasants, as it requires continued dry weather in autumn for profitable harvesting. In Germany buckwheat is much valued as a crop, particularly for moor-lands and other poor soils. In Bretagne, also, it is as extensively cultivated as wheat. It yields

very abundantly, and requires little attention and little manure. Forty bushels or more per acre may be expected, weighing 46 or 48 lbs. per bushel; and notwithstanding the resemblance of the seed to grain in its qualities and uses, wheat, or any other cereal crop, generally succeeds well after buckweat, if care has been taken to keep the land clear by tilling. The seed is most frequently used in the shape of groats, or made into pottage, and in the United States thin cakes made from it, and baked on a griddle, are extensively used. It is very nutritious, containing about 10 per cent. of gluten and 52 per cent. of starch, besides about 6 per cent. of gum and sugar. It is said to be as good as barley for fattening cattle, and bettter for horses than oats. But as the seed is covered with a very hard rind or thin shell, it must always be shelled before being given to cattle. Poultry are very fond of it. Beer is sometimes brewed from it, and it yields a spiritous liquor of good quality; indeed, it is frequently used in gin distilleries. As green fodder, the herbage of the plant is said to be more nutritious than clover; but it acts as a narcotic on sheep. Bees delight in its flowers, and in some parts of the United States it is sown on this account. In America the seed is usually sown broadcast over the land which has been plowed in autumn or early spring, and well scarified or harrowed. About a bushel and a half of seed is required when sown broadcast, but a bushel is sufficient if drilled with a machine. In the latter case it should not be sown in narrower drills than one ft. apart, but two ft. is recommended as being better for the succeeding crop, as the wider intervals can be properly cultivated. It should not be sown too early, as the least frost is injurious. When the lower seeds are ripe it should be mown, as they are easily shed out if allowed to stand too long. When bread made from buckwheat forms the principal food of the people, it is thought to have an injurious action on the brain. As a supplementary article, however, it is a favorite among all classes where it is raised. It was once much used for griddle-cakes, but its constant use produces eruptions of the skin and general disturbance of the system.—TARTARIAN B. *(F.* or *P. Tartaricum)* is distinguished by the toothed edges of the seeds and its more vigorous growth. It is hardy, and adapted for cold situations. It is a native of Siberia. It is very productive, but the seed falls out when ripe more readily than that of the common species; and the flour is darker colored, and somewhat bitter.—NOTCH-SEEDED B. *(F.* or *P. emarginatum)* is said to be a native of China. Its seeds are larger than those of Common B., and their angles are winged.—PERENNIAL B. *(F.* or *P. cymosum)* is a native of Nepaul, very vigorous in its growth, but producing comparatively little seed.—The triangular black seed of Climbing Buckwheat or Blackbine *(F.* or *P. Convolvulus)*, fa-

miliar to every one who has eaten oatmeal cakes or porridge, greatly resembles buckwheat, but is smaller. The plant—a very common weed in gardens and cornfields—also exhibits much similarity, notwithstanding its different habit and twining stem and is a pernicious weed.—DYER'S B. is *Polygonum tinctorium*. See POLYGONEÆ.

BUCKWHEAT TREE *(Cliftonia ligustrina*, ord. *Cyrillaceæ)*: evergreen shrub called 'titi' in the gulf states, where it grows around ponds and on the banks of streams. Its white blossoms are fragrant, and its fruit resembles buckwheat, whence the name.

BUCOLIC, n. *bū-kŏl'ĭk* [L. *bucolĭcus;* Gr. *bukolĭkos* —from Gr. *bou'kolos*, a cowherd—from *bous*, an ox]: a pastoral poem: ADJ. relating to country affairs: see PASTORAL POETRY.

BUCYRUS, *bū-sī'rŭs*, Ohio, a city and county-seat of Crawford County, situated on the Sandusky River and on the Pennsylvania, the Ohio C., and Sandusky division of the Pa. R. R.'s. Stockraising and farming are carried on in the surrounding region and the city is actively engaged in manufacture. Among the products of the mills and shops are machinery, ventilating apparatus, plows, vehicles, and furniture. There are school and county buildings, a reservoir, and waterworks. There is a park in the city, and numerous mineral springs in the surrounding region. Bucyrus was settled in 1818 and incorporated in 1829. Pop. (1900) 6,560.

BUD, n. *bŭd* [Bav. and Dut. *botzen*, a knob, a bud: Bret. *bôd*, a tuft: Dan. *pode*, a shoot: Bohem. *bodka*, a point]: the shoot or sprout on a plant containing the future leaf or flower; a flower not blown or expanded: V. to put forth shoots; to sprout; to grow as buds. BUD'DING, imp.: ADJ. putting forth buds; growing in freshness and beauty: N. a kind of grafting by buds. BUD'DED, pp. BUD'LET, n. a bud growing from another bud.—SYN. of 'bud, v.': to sprout; shoot; germinate.

BUD *(gemma)*, in Botany: that part of a plant which contains the rudiments of leaves or flowers prior to their development. Buds are distinguished into *leaf-buds* and *flower-buds*, the former producing leaves and having a power of extension into a branch; the latter producing flowers only, and ordinarily destitute of this power of extension. The different parts of the flower being regarded, however, as *leaf-organs* or altered leaves (see FLOWER), the flower-bud may be regarded as merely a modified leaf-bud; and it is well known that by treatment which checks the luxuriant growth of a plant, it may be caused to produce flower-buds where only leaf-buds could otherwise have been expected to appear—a physiological fact, of which advantage is taken in various ways by gardeners, as by removing portions of the bark, and even of the woody part of the

stem, root-pruning, confining the roots in a flower-pot, etc. Buds usually appear in the axils of leaves, the terminal bud of a branch being no exception to this rule; and there is no leaf without one or more buds in its axil, although many never pass beyond the most rudimentary state. See BRANCH. In cold and temperate climates, buds are formed about mid-summer, beginning to appear as soon as the young branch which bears them has itself been properly developed, and are generally covered with scales and often also coated with resinous matter, by which their tender contents are protected from the severity of winter: but in the trees of warm climates, the protection of scales is generally wanting. Within the leaf-bud, the future leaves may be discovered, often very curiously folded or rolled up, and the different forms and positions which the leaves assume in the bud, are very characteristic of different kinds of plants. This is called the *vernation* (q.v.) of leaves, and is analogous to the *æstivation* (q.v.) of flowers. The buds of exogenous plants originate in cellular prolongations of the medullary rays bursting through the bark; those of endogenous plants are in communication with the cellular matter which lies between the bundles of woody tissue in the stem; and buds elongate into branches by the addition of new cellular matter to the extremity. Leaf-buds are capable of subsisting when separated from the parent plant and placed in favorable situations developing themselves into new plants with the most exact correspondence in their characteristics to the parent plant; and of this gardeners avail themselves in the process of *budding* (q.v.), and in various ways for the propagation of plants. Some plants propagate themselves by a natural detachment of buds (*bulbils* or *bulblets*) modified into a character analogous to that of *bulbs* (q.v.); and bulbs themselves may indeed be regarded as a compact arrangement of leaves on a compressed stem, in the axil of each of which there is a bud that may be made to develop independently for propagation. The *eyes* of the potato are also subterranean leaf-buds, the tuber being regarded as a thickened subterranean stem; and all plants with subterranean stems produce subterranean leaf-buds, sending above ground only herbaceous annual shoots, as asparagus, the banana, etc. Buds may be produced in exogenous plants from the extremity of any medullary ray, and may be made to spring from a leafless part of the stem by an incision, the effect of which is to direct a greater supply of sap to the part immediately beneath it. In a few plants, buds are produced on the edges, or even on the surface of leaves. In consequence of their power of independent existence, buds have been looked upon by some physiologists as distinct organized beings congregated in the tree or plant, a view which involves exaggeration, and therefore error.—Flower-buds cannot be

used for budding, or otherwise for propagation of the plant, but when removed from their original stock always die.

Some of the lowest animals propagate themselves by buds *(gemmation)*, and many of the zoophyte systems or polypidoms extend in this manner: see REPRODUCTION: POLYPI: ZOOPHYTES. Also see BUDDING.

BUDA, *bô'dŏ* (Slavonic, *Bu'din:* German, *O'fen*): city of Hungary, forming with Pesth, *pĕsht* (with which it is united by a magnificent suspension-bridge) the capital of the country; on the right bank of the Danube, about 130 m. s.e. of Vienna; lat. 47° 29′ n., long. 19° 3′ e. Buda has a highly picturesque appearance, being built round the Schlossberg (Castle-hill) in the form of an amphitheatre, in the midst of a district covered with vineyards. Crowning this centre hill or rock, which has an elevation of 485 ft. above the sea, is the citadel; the palace in which are preserved the royal insignia of Hungary; and an old Gothic church. Behind, and towering above the rock, rises the Blocksberg, strongly fortified, with a precipitous face to the Danube, the slopes of the other sides being occupied with houses. Buda has many educational and charitable institutions; and a fine observatory crowns the Blocksberg. It has some celebrated hot sulphur springs, with a temperature of 117° 5′ F., from which it derives its German name, Ofen (Oven). Three of the baths erected by the Turks are still in perfect preservation, and frequented by the common people. Buda has some manufactures of silk, velvet, woolen, cotton, leather, and gunpowder; and cannon and type-foundries; but its chief trade is in wine, of which it produces between four and five millions of gallons annually. This is known as the 'Ofenerwein,' and is of excellent quality. Buda is a place of great antiquity, but its importance dates from 1240, when the fortress was erected on the Schlossberg. During the inroads of the Turks it was regarded as the key of Christendom. It was captured by Solyman the Magnificent 1526, but retaken in the following year by Ferdinand I., King of Bohemia. In 1541. it was again taken by Solyman, who introduced into it a garrison of 12,000 janizaries; and it remained in the possession of the Turks until 1686, when it was captured by the Duke of Lorraine. Buda and Pesth (q.v.) were in 1872 incorporated with one another, the official name being the compound *Budapest*. Pop. (1900) 732,322.

BUDÆUS, *bū-dē'ŭs* (Latinized form of *Guillaume Bude)*: 1467–1540, Aug. 23; b. Paris: one of the greatest French scholars of his age. He studied at Paris and Orleans. His works on philology, philosophy, and jurisprudence show extensive learning, but the two best known are the *De Asse et Partibus ejus* (Paris 1514), which contains a very thorough investigation into

ancient coins and the *Commentarii Linguæ Græcæ* (Paris 1519), which greatly advanced the study of Greek literature in France, and is still held in high estimation by classical scholars. Budæus' knowledge of Greek was particularly good. His style both in Latin and French is nervous, but harsh, and abounds in Greek constructions. His abilities were manifested not only in literature, but in public business. Louis XII. twice sent him to Rome as ambassador; and Francis I. also employed him in several negotiations. At Budæus' suggestion, Francis founded the *Collége de France*, and was also persuaded to refrain from the prohibition of printing which the bigoted Sorbonne had advised in 1533. Budæus held several important offices. He was royal librarian, maître des requêtes, and provost of Paris. A collected edition of his works appeared at Basel 1557. Budæus was suspected of a leaning toward Calvinism. Certain circumstances render this highly probable. In his correspondence with his friend Erasmus, he repeatedly expresses his contempt for monks and ignorant ecclesiastics, and on one occasion terms the doctors of the Sorbonne 'prating sophists.' Besides, shortly after his death, his widow and several members of his family went to Geneva, and openly abjured Roman Catholicism.

BUDAON, *bô-dâ-on'*, or BUDAUN, or BUDAYOON, *bô-dâ-ôn':* town of India, 140 m. n.w. of Lucknow, giving its name to a British dist. of the Rohilcund division of the lieut. governorship of the N. W. Provinces. It is in 28° 2′ n. lat., 79° 11′ e. long. Its pop. was officially ascertained in 1881 to amount to 35,372. It was occupied by the mutineers and a body of liberated prisoners from Bareilly, 1857, June 1. The Europeans escaped by flight. It was captured by General Whitelock, 1858, Apr. 19. The district of BUDAON is a level, fertile tract on the Ganges and its tributaries, of which the chief is the Ramgunga; area 2,002 sq. m.; pop.—nearly six-sevenths Hindus, and the rest mostly Mussulmans, about 1,000,000.

BUDAPEST: see BUDA: PESTH.

BUDDÆUS, *bûd-dā'ûs*, JOHANN FRANZ: Lutheran theologian: 1667–1729; b. Anklam, Prussia. He studied at Griefswald and Wittenberg, was appointed professor of Greek and Latin at Coburg, later professor of ethical science and politics at Halle, and in 1705 professor of divinity at Jena. B. is the author of many valuable works, especially on moral and religious philosophy. Among the principal are: a large historical German dictionary (Leipzig 1709); *Historia Ecclesiastica Veteris Testamenti* (4 vols., Halle 1709); *Elementa Philosophiæ Practicæ, Instrumentalis et Theoreticæ* (3 vols., 1703); *Selecta Juris Naturæ et Gentium* (Halle 1704); *Miscellanea Sacra* (3 vols., Jena 1727); *Isagoge Historico-Theologica ad Theologiam Universam singulasque ejus partes* (2 vols.); etc.

BUDDHISM.

BUDDHISM, n. *bŭd'ĭzm*, also spelled Boodhism, n. *bôd'-ĭzm* [*Buddha*, the enlightened]: a religion widely prevailing over a great part of Asia, whose founder was an Indian prince named Buddha, *bŭd'dă*, or Boodh, *bôd;* he lived at some indefinite period B.C., and taught that all visible and sensible things are but manifestations of the Deity, that the human soul is an emanation from God, and that the soul will, by a holy life, again be absorbed into the divine essence; *Boodh* is practically an object of worship to his folowers. Bud'dhist, or Bood'hist, n. a worshipper of Buddha, and believer in his doctrines: Adj. pertaining to. Buddhistic, or Boodhistic, a. *bôd-ĭs'tĭk*, akin or tending to Buddhism: see Buddhism—Buddh.

BUD'DHISM—BUD'DHA: an oriental religion, and its founder. Buddhism (from the title of 'The Buddha,' meaning 'the Wise,' 'the Enlightened,' acquired by its founder) has existed for 2,460 years, and may be said to be the prevailing religion of the world. In Hindustan, the land of its birth, it has now little hold, except among the Nepaulese and some other northern tribes; but it bears sway in Ceylon, and over the whole Eastern Peninsula; it divides the adherence of the Chinese with the systems of Confucius and Lao-tse, claiming perhaps two-thirds of the population; it prevails also in Japan (though not the established religion); and, n. of the Himalayas, it is the religion of Tibet (where it assumes the form of Lamaism), and of the Mongolian population of Central Asia, and extends to the very n. of Siberia, and even into Swedish Lapland. Its adherents are estimated at 400 millions—more than a third of the human race. Yet, till near the middle of this century, nothing was known in Europe respecting the nature and origin of this world-religion, beyond vague notices and conjectures. About 1828, Mr. B. H. Hodgson, British resident at the court of Nepaul, where Buddhism prevails, discovered the existence of a large set of writings in the Sanskrit language, forming the national canonical books. These books have since been found to be the texts from which the Buddhist scriptures of Tibet, Mongolia, and China must have been translated. The books of the Ceylon Buddhists are in the language called Pali; and though not translations of the Nepaulese standards, they are found to agree with them in substance, and to be only another and somewhat later version of the same traditions. Translations from the Ceylon standards are used by the Buddhists of Burmah and Siam. Copies of the Sanskrit books of Nepaul, having been sent by Mr. Hodgson to the Asiatic Societies of London and Paris, engaged the attention of the eminent Oriental scholar, Eugène Burnouf, who published 1844 his *Introduction to the History of Buddhism;* and this book may be said to have been the beginning of correct information on the subject among the western nations.

Most diverse opinions had previously been held as to the time and place of the origin of Buddhism. Some looked upon it as a relic of what had been the original religion of Hindustan, before Brahmanism intruded and drove it out; a relic of a wide-spread primeval worship, whose ramifica

tions it was endeavored to trace by identifying Buddha with the Woden of the Scandinavians, the Thoth or Hermes of the ancient Egyptians, and other mythological personages. Others held that it could not be older than Christianity, and must have originated in a blundering attempt to copy that religion—so striking are some points of resemblance. Although the means are still wanting of giving a circumstantial history of Buddhism, the main outline is no longer doubtful. Oriental scholars now concur in fixing the date of its origin about the beginning of B. C. 6th c., and the place in the n. of Hindustan. According to the Buddhist books, the founder of the religion was a prince of the name of Siddhartha, son of Suddhodana, King of Kapilavastu, which is placed somewhere on the confines of Oude and Nepaul. He is often called Sakya, which was the name of the family, and also Gautama, the name of the great 'Solar' race of which the family was a branch. The name Sakya often becomes Sakya-muni (*muni*, in San., means 'solitary,' and is allied to Gr. *monos*, the root of 'monk'), in allusion to the solitary habits assumed by the prince. To Gautama is frequently prefixed *Sramana*, meaning *ascetic*. Of the names, or rather titles, given to Siddhartha in his state of perfection, the most important is the *Buddha*,* which is from the root *budh*, to know, and according to Wilson, means properly, 'he to whom truth is known;' it is indicative of the leading doctrine of his system. Others are—'The Blessed' (Bhagavat); 'the Venerable of the World;' 'the Bodhisatva,' the import of which will be afterward explained. The history of this person is overlaid with a mass of extravagant and incredible legend; and at least one eminent Orientalist, Professor H. H. Wilson, thinks it still doubtful whether the Buddha was an actual historical personage, and not rather an allegorical figment. Agreeing that the doctrine was introduced about the time assigned, he thinks it more likely that it originated with a school formed of persons of various castes, comprising even Brahmans. But by Oriental authorities generally, the Buddha is received as the actual personal founder of the religion that goes by his name.

Assuming that the Buddha was a real person, and that there is a basis of fact under the mass of extravagant fable with which he is surrounded, the history of Buddhism may be thus briefly outlined: The Prince Siddhartha gives early indications of a contemplative, ascetic disposition; and his father, fearing lest he should desert his high station as Kshatriya (see HINDUISM and CASTE) and ruler, and take to a religious life, has him early married to a charming princess, and surrounded with all the splendor and dissipation of

* There is a confusing variety in the modes in which this name is spelled by European writers. S. Hardy, in his *Manual of Buddhism*, gives more than 50 forms that have come under his notice. Some of the more common are: Bud, Bod, Buth, Budh, Boodh, Bhood, Budo, Buddow, Boutta, Poota, Poth, Pot. The Chinese, owing to the meagreness of their articulations, seem to have been unable to come nearer to the real sound than Fo, Foe, or Fohi; from the same cause, they convert Brahma into Fan.

a luxurious court. Twelve years spent in this environment only deepen the conviction that all that life can offer is vanity and vexation of spirit. He is constantly brooding over the thought that old age, withered and joyless, is fast approaching; that loathsome or racking sickness may at any moment seize him; that death will at all events soon cut off all present sources of enjoyment, and usher in a new cycle of unknown trials and sufferings. These images hang like Damocles' swords over every proposed feast of pleasure, and make enjoyment impossible. He therefore resolves to try whether a life of austerity will not lead to peace; and, although his father seeks to detain him by setting guards on every outlet of the palace, he escapes, and begins the life of a religious mendicant, being now about 30 years old. To mark his breaking off all secular ties he cuts off the long locks that were a sign of his high caste; and as the shortened hair turned upward, he is always represented in figures with curly hair, which induced early European writers to consider him as of Ethiopian origin. He commences by studying all that the Brahmans can teach him, but finds their doctrine unsatisfactory. Six years of rigorous asceticism are equally vain; and resolving to return to a more genial life he is deserted by his five disciples, and then undergoes a fierce temptation from the demon of wickedness. But no discouragement or opposition can divert Sakyamuni from the search after deliverance. He will conquer the secret by sheer force of thinking. He sits for weeks plunged in abstraction, revolving the causes of things. If we were not born, he reflects, we should not be subject to old age, misery, and death; therefore the causes of these evils is birth. But whence comes birth or continued existence? Through a long concatenation of intermediate causes, he arrives at the conclusion that ignorance is the ultimate cause of existence; and therefore, with the removal of ignorance, existence and all its anxieties and miseries would be cut off at their source. Passing through successive stages of contemplation, he realizes this in his own person, and attains the perfect wisdom of the Buddha. The scene of this final triumph received the name of Bodhimanda (the seat of intelligence), and the tree under which he sat was called Bodhidruma (the tree of intelligence), whence Bo-tree. The Buddhists believe the spot to be the centre of the earth. Twelve hundred years after the Buddha's death, Hiouen-Thsang, the Chinese Pilgrim, found the Bodhidruma—or a tree that passed for it—still standing. Although the religion of Buddha is extinct in the neighborhood, there are, about 5 m from Gaya Proper, in Bahar, extensive ruins, and an old dagoba, or a temple, which are believed to mark the place. Near the temple there flourished 1812, a peepul-tree, apparently 100 years old, which may have been planted in the place of the original Bo-tree.

Having arrived at the knowledge of the causes of misery, and of the means by which these causes are to be counteracted, the Buddha was now ready to lead others on the road to salvation. It was at Benares that he first preached,

BUDDHA.

or, in the consecrated phrase, 'turned the wheel of the law;'* but the most important of his early converts was Bimbisara, sovereign of Magadha (Bahar) whose dynasty continued for many centuries to patronize the new faith. During the 40 years that he continued to preach his strange gospel, he appears to have traversed a great part of n. India, combating the Brahmans, and everywhere making numerous converts. He died at Kusinagara (in Oude), at the age of 80, B.C. 543; and his body being burned, the relics were distributed among a number of contending claimants, and monumental tumuli were erected to preserve them. See TOPES.

The most important point in the history of Buddhism, after the death of its founder, is that of the three councils which fixed the canon of the scriptures and the discipline of the church. The Buddha had written nothing himself; but his chief followers, assembled in council immediately after his death, proceeded to reduce his teaching to writing. These canonical writings are divided into three classes forming the Tripitaka, or 'triple basket.' The first class consist of the *Soutras*, or discourses of the Buddha; the second contains the *Vinaya*, or discipline; and the third the *Abhidharma*, or metaphysic. The first is evidently the fundamental text out of which all the subsequent writings have been elaborated. The other two councils probably revised and expanded the writings agreed upon at the first, adding voluminous commentaries. As to the dates of the other two councils, there are irreconcilable discrepancies in the accounts; but at all events the third was not later than B.C. 240, so that the Buddhist canonical scriptures, as they now exist, were fixed two centuries and a half before the Christian era. The Buddhist religion early manifested a zealous missionary spirit; and princes and even princesses, became devoted propagandists. A prince of the royal house of Magadha, Mahindo, carried the faith to Ceylon, B.C. 307. The Chinese annals speak of a Buddhist missionary as early as B.C. 217; and the doctrine made such progress that in A.D. 65, it was acknowledged by the Chinese emperor as a third state religion. The Chinese Buddhists have always looked on India as their 'holy land;' and beginning with the 4th c. of our era, a stream of Buddhist pilgrims continued to flow from China to India during six centuries. Several of these pilgrims have left accounts of their travels, which throw a light on the course of Buddhism in India, and on the internal state of the country in general, that is looked for in vain in the literature of India itself: see HIOUEN-THSANG. As to the spread of Buddhism n. of the Himalayan mountains, we have the historical fact, that a Chinese general, having, about B.C. 120, defeated the barbarous tribes to the n. of the Desert of Gobi, brought back as a trophy a golden statue of the Buddha.

* From a too literal understanding of this phrase have arisen, probably, those praying-wheels, or rather wheels for meditation, seen standing before Buddhist monasteries in Tibet and elsewhere. The doctrines of Buddha are inscribed on the wheel, which is then set in motion by a windlass, or even by horse-power. The individual monks have portable ones, with which they perform their devotions wherever they may happen to be.

BUDDHISM.

A prominent name in the history of Buddhism is that of Asoka, king of Magadha, in the 3d c. of our era, whose sway seems to have extended over the whole peninsula of Hindustan, and even over Ceylon. This prince was to Buddhism what Constantine was to Christianity. He was at first a persecutor of the faith, but being converted—by a miracle, according to the legend—he became its zealous propagator. Not, however, as princes usually promote their creed; for it is a distinguishing characteristic of Buddhism, that it has never employed force, hardly even to resist aggression. Asoka showed his zeal by building and endowing viharas or monasteries, and raising topes and other monuments over the relics of Buddha and in spots remarkable as the scenes of his labors. Hiouen-Thsang, in the 7th c. of our era, found topes attributed to Asoka from the foot of the Hindu Kush to the extremity of the peninsula. There are found, also, in different parts of India, edicts inscribed on rocks and pillars, inculcating the doctrines of Buddha. The edicts are in the name of King Piyadasi; but Orientalists are almost unanimous in holding Piyadasi and Asoka as the same. Not a single building or sculptured stone has been discovered in continental India of earlier date than the reign of this monarch, whose death is assigned to B.C. 226. A remarkable spirit of charity and toleration runs through these royal sermons. The 'king beloved of the gods' desires to see the ascetics of all creeds living in all places, for they all teach the essential rules of conduct. 'A man ought to honor his own faith only; but he should never abuse the faith of others. . . . . There are even circumstances where the religion of others ought to be honored, and in acting thus a man fortifies his own faith, and assists the faith of others.'

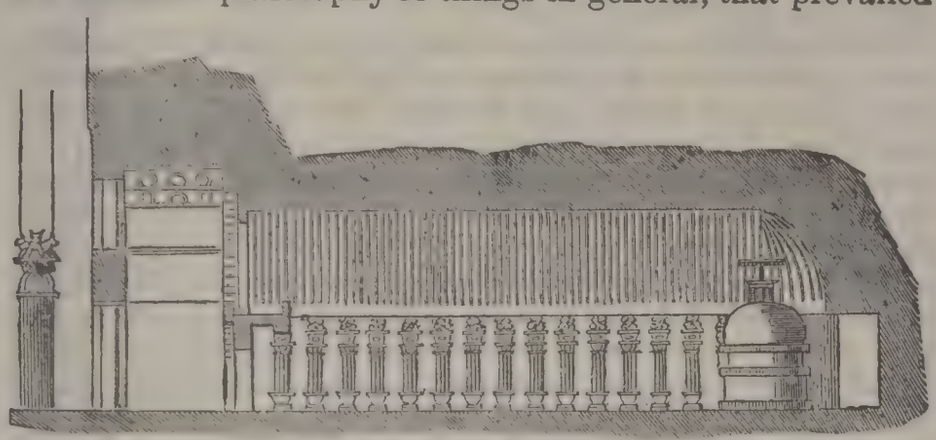
For the glimpses which we get of the state of Buddhism in India, we are indebted chiefly to the accounts of Chinese pilgrims. Fa-hian, at the end of the 4th c., found some appearances of decline in the e. of Hindustan, its birthplace, but it was still strong in the Punjab and the north. In Ceylon it was flourishing in full vigor, the ascetics or monks numbering from 50,000 to 60.000. In the 7th c.—that is, 1,200 years after the death of the Buddha—Hiouen Thsang represents it as widely dominant and flourishing, and patronized by powerful rajahs. Its history was doubtless more or less checkered. The Brahmans, though little less tolerant than the followers of Buddha, seem to have been in some cases roused into active opposition; and some princes employed persecution to put down the new faith.

It was probably during the first four or five centuries of our era, and as a result of persecution, that Buddhists, driven from the great cities, retired among the hills of the west, and there constructed those cave-temples which, for their number, vastness, and elaborate structure, continue to excite the wonder of all who see them. There are reckoned to be not fewer than 900 Buddhists excavations extant in India, nearly all within the presidency of Bombay. How the destruction of the Buddhist faith in Hindustan came about—whether from internal corruption or the persecution

of powerful princes, adherents of the old faith—is utterly unknown. But it is certain that from the time of Hiouen-Thsang's visit its decay must have been rapid beyond precedent; for about the 11th or 12th c., the last traces of it disappear from the Indian peninsula.

What, then, is the nature of this faith, which has been for so long, and is still, the sole light of so many millions of human beings? In answering this question, we must confine ourselves here to a brief outline of the intellectual theory on which the system is based, and of the general character of its morality and ritual observances, as they were conceived by the founder and his more immediate followers, referring for the various forms which the external observances have assumed to the several countries where it is believed and practiced: see BURMAH: CEYLON: CHINA: JAPAN: LAMAISM.

Buddhism is based on the same views of human existence, and the same philosophy of things in general, that prevailed



Section of Buddhist Cave-temple at Karli—from Fergusson's *Handbook of Architecture.*

among the Brahmans. It accepts without questioning, and in its most exaggerated form, the doctrine of the transmigration of souls, which lies at the root of so much that is strange in the Eastern character. For a particular account of this important doctrine or notion, which seems ingrained in the constitution of Eastern minds, and without a knowledge of which no phase of thought or feeling among them can be understood, see TRANSMIGRATION; while for the peculiar cosmogony or system of the universe with which it is associated, and which is substantially the same among Hindus and Buddhists, see HINDUISM. It is sufficient here to say, that, according to Buddhist belief, when a man dies he is immediately born again, or appears in a new shape; and that shape may, according to his merit or demerit, be any of the innumerable orders of being composing the Buddhist universe—from a clod to a divinity. If his demerit would not be sufficiently punished by a degraded earthly existence—in the form, for instance, of a woman or a slave, of a persecuted or a disgusting animal, of a plant or even of a piece of inorganic matter—he will be born in some one of the 136 Buddhist hells, in the interior of the earth. These places of punishment have a regular gradation in the intensity of the suffering and in the length of time the sufferers live, the

least term of life being ten millions of years, the longer terms being almost beyond the powers of even Indian notation to express. A meritorious life, on the other hand, secures the next birth either in an exalted and happy position on earth, or as a blessed spirit, or even divinity, in one of the many heavens; in which the least duration of life is about ten billions of years. But, however long the life, whether of misery or of bliss, it has an end, and at its close the individual must be born again, and may again be either happy or miserable—either a god or, it may be, the vilest inanimate object.* The Buddha himself, before his last birth as Sakyamuni, had gone through every conceivable form of existence, on the earth, in the air, and in the water, in hell and in heaven, and had filled every condition in human life. When he attained the perfect knowledge of the Buddha, he was able to recall all these existences; and a great part of the Buddhist legendary literature is taken up in narrating his exploits when he lived as an elephant, as a bird, as a stag, and so forth.

The Buddhist conception of the way in which the quality of actions—which is expressed in Pali by the word *Karma*, including both merit and demerit—determines the future condition of all sentient beings, is peculiar. They do not conceive any god or gods as being pleased or displeased by the actions, and as assigning the actors their future condition by way of punishment or of reward. The very idea of a god, as creating, or in any way ruling the world, is utterly absent in the Buddhist system. God is not so much as denied; he is simply not known. The opinion has been confidently and generally held that a nation of atheists never existed; however this may be, it is no longer to be disputed that the numerous Buddhist nations are, in the department of their intellectual or philosophical conceptions, atheist; for their philosophy recognizes no beings with greater supernatural power than any man is supposed capable of attaining to by virtue, austerity, and science; and a remarkable indication of this is seen in the fact that some at least of the Buddhist nations—the Chinese, Mongols, and Tibetans—have no word in their languages to express the notion of God. The future condition of the Buddhist, then, is not assigned him by the Ruler of the universe; the 'Karma' of his actions determines it by a sort of virtue inherent in the nature of things—by the blind and unconscious concatenation of cause and effect. But the laws by which consequences are regulated seem dark, and even capricious. A bad action may lie dormant, as it were, for many existences; the taint, however, is there, and will some time or other break out. A Buddhist is thus never at a loss to account for any calamity that may befall himself or others.

Another basis of Buddhism is the assumption that hu-

* One legend makes Bhagavat, in order to impress upon the monks of a monastery the importance of their duties, point to a besom, and, by his supernatural insight, reveal to them that it had once been a novice, who had been negligent in sweeping the hall of assembly; the walls and pillars again, he told them, had once existed as monks, who soiled the walls of the hall by spitting upon them.

man existence is on the whole miserable, and a curse rather than a blessing. This notion, or rather feeling, is, like transmigration, common to Buddhism and Brahmanism, but is even more prominent in Buddhism than in the old faith. It is difficult for a European to conceive this state of mind or to believe that it can be habitual in a whole people; and many signal errors in dealing with the Indian nations have arisen from overlooking the fact. Not excluding the possibility of deep causes in their moral or intellectual constitution, one cause seems to lie chiefly in the comparatively feeble physical organization of Easterns in general. With a vigorous animal vitality there is a massive enjoyment in mere bodily existence sufficient to drown a large amount of irritation and suffering, leaving life still sweet and desirable; while the spontaneous activity attending this vigor, makes it a pleasure instead of a pain to contend with and conquer difficulties. The Indian, on the contrary, even when he looks robust, lacks intensity of animal vitality; and, therefore, bodily existence, in itself, has to him little relish. Tedium of life, it is well known, arises more from negative than positive sources; and it requires but little bitter added to make his cup disgusting. So far, again, from finding activity a source of enjoyment, exertion is painful, and entire quiescence is, in his eyes, the highest state of conceivable enjoyment. When to this we add that want of security and peace, and that habitual oppression of the many by the few, with all the attendant degradation and positive suffering, which may be considered the normal state of things in the East, need we wonder that to men so constituted and so circumstanced, life should seem a burden, a thing rather to be feared than otherwise? The little value that Hindus set upon their lives is manifested in many ways. The punishment of death has little or no terror for them, and is even sometimes coveted as an honor. For, in addition to the little value of their present existence, they have the most undoubting assurance that their soul, if dislodged from its present tenement, will forthwith find another, with a chance, at least, of its being a better one.

In the eyes, then, of Sakya-muni and his followers, sentient existence was hopelessly miserable. Misery was not a mere taint in it, the removal of which would make it happy; misery was its very essence. Death was no escape from this inevitable lot; for, according to the doctrine of transmigration, death was only a passage into some other form of existence equally doomed. Even the heaven and the state of godhead which form part of the cycle of changes in this system, were not final; and this thought poisoned what happiness they might be capable of yielding. Brahman philosophers had sought escape from this endless cycle of unsatisfying changes, by making the individual soul be absorbed in the universal spirit (Brahm); Gautama had the same object in view, viz., exemption from being born again; but he sought it by a different road. His philosophy was utterly atheistic, like that of the original Sankhya school of philosophy, whose views he chiefly bor-

rowed, and ignored a supreme God or Creator; it did not leave even an impersonal spirit of the universe into which the human soul could be absorbed. Gautama sees no escape but in what he calls NIRVANA, the exact nature of which has been matter of dispute. According to its etymology, the word means 'extinction,' 'blowing out,' as of a candle; and most Orientalists are agreed that in the Buddhist scriptures generally it is practically equivalent to annihilation. Even in those schools which attempt to draw a distinction, the distinction is of the most evanescent kind. See NIRVANA.

The key of the whole scheme of Buddhist salvation lies in what Gautama called his Four Sublime Verities. The first asserts that pain exists; the second, that the cause of pain is desire or attachment—the meaning of which will appear further on; the third, that pain can be ended by Nirvana; and the fourth shows the way that leads to Nirvana. This way to Nirvana consists in eight things: right faith, right judgment, right language, right purpose, right practice, right obedience, right memory, and right meditation. In order to understand how this method is to lead to the proposed end, we must turn to the metaphysical part of the system contained in the 'concatenation of causes' which may be looked upon as a development of the second 'verity'—namely, that the cause of pain is desire—or which may be looked upon rather, as the analysis upon which that verity is founded. The immediate cause of pain is birth, for if we were not born, we should not be exposed to death or any of the ills of life. Birth again, is caused by previous existence; it is only a transition from one state of existence into another. All the actions and affections of a being throughout his migrations leave their impressions, stains, attachments adhering to him, and the accumulation of these determines at each stage the peculiar modification of existence that he must next assume. But for these adhesions, the soul would be free; not being bound down to migrate into any determinate condition of life, the result would be that it need not migrate at all. These adhesions or attachments, good and bad, depend upon desire, or rather upon affection of any kind in the soul toward the objects; as if only what moved the soul to desire or avoidance could leave its impress upon it. We thus arrive at desire—including both the desire to possess, and the desire to avoid—as one link in the chain of causes of continued existence and pain. Beyond this the dependence of the links is very difficult to trace; for desire is said to be caused by perception, perception by contact, and so on, until we come to ideas. Ideas, however, are mere illusions, results of ignorance or error, attributing durability and reality to that which is transitory and imaginary. Cut off this ignorance, bring the mind into a state in which it can see and feel the illusory nature of things, and forthwith the whole train vanishes; illusory ideas, distinction of forms, senses, contact, perception, desire, attachment, existence, birth, misery, old age, death!

Morality and Religious Observances.—The eight parts or

particulars constituting the theoretical 'way' (to Nirvana), were developed by Gautama into a set of practical precepts enjoining the various duties of common life and of religion. They all are ostensibly intended as means of counteracting or destroying the chain of causes that tie men to existence and necessitate being born again, especially that most important link in the chain constituted by the attachments or desires resulting from former actions, although the special fitness of some of the precepts for that end is far from being apparent. It is easy to understand how the austerities that are prescribed might subdue the passions and affections, and lessen the attachment to existence; but how the exercise of benevolence, of meekness, of regard to truth, of respect to parents, etc., on which Gautama laid so much stress, should have this effect, it is difficult to conceive. Luckily for the Buddhist world, Gautama's moral nature was better than his logic, or rather than the perverse assumptions from which his logic starts; and as he felt strongly—what all men feel more or less—that these things are essentially right and good, he takes it for granted that they must contribute to what was in his eyes the chief good—escape from existence, or Nirvana. Moreover, as men's usual 'desires' were seen by him to be contrary to meekness, benevolence, and the like, he might well judge that to practice these virtues might tend to repress the power of 'desire' and to end its sway. In delivering his precepts the Buddha considers men as divided into two classes—those who have embraced the religious life (*sramanas*) and those who continue in the world or are laymen. These last are considered as too much attached to existence to feel any desire or have any hope of emancipation, at least at this stage. But there are certain precepts which it is necessary for all to obey, that they may not bring greater misery upon themselves in their next births, and rivet the bonds of existence more indissolubly. There are ten moral precepts or 'precepts of aversion.' Five of these are of universal obligation—viz., not to kill; not to steal; not to commit adultery; not to lie; not to be drunken. Other five are for those entering on the direct pursuit of Nirvana by embracing the religious life: to abstain from food out of season—that is, after mid-day; to abstain from dances, theatrical representations, songs, and music; to abstain from personal ornaments and perfumes; to abstain from a lofty and luxurious couch; to abstain from taking gold and silver. For the regular ascetics or monks, there are a number of special observances of great severity. They are to dress only in rags, sewed together with their own hands, and to have a yellow cloak thrown over the rags. They are to eat only the simplest food, and to possess nothing except what they get by collecting alms from door to door in their wooden bowl. They are allowed only one meal, and that eaten before mid-day. For a part of the year, they are to live in forests with no shelter except the shadow of a tree, and there they must sit on their carpet even during sleep, to lie down being forbidden. They are allowed to enter

the nearest village or town to beg food, but they must return to their forests before night.

Beside the absolutely necessary 'aversions and observances' above mentioned, the transgression of which must lead to misery in the next existence, there are certain virtues or 'perfections' of a supererogatory or transcendent kind, that tend directly to 'conduct to the other shore' (Nirvana). The most essential of these are almsgiving or charity, purity, patience, courage, contemplation, and knowledge. Charity or benevolence may be said to be the characteristic virtue of Buddhism—a charity boundless in its self-abnegation, and extending to every sentient being. The benevolent actions done by the Buddha himself, in the course of his many millions of migrations, were favorite themes with his followers. On one occasion, seeing a tigress starved and unable to feed her cubs, he hesitated not to make his body an oblation to charity, and allowed them to devour him. Benevolence to animals, with that tendency to exaggerate a right principle so characteristic of the East, is carried among the Buddhist monks to the length of avoiding the destruction of fleas and the most noxious vermin, which they remove from their persons with all tenderness.

There are other virtues of a secondary kind, though still highly commendable according to the Buddhist standard. Thus, not content with forbidding lying, the Buddha strictly enjoins the avoidance of all offensive and gross language, and of saying or repeating anything that can set others at enmity among themselves; it is a duty, on the contrary, especially for a sramana, to act on all occasions as a peacemaker. Patience under injury, and resignation in misfortune, are strongly inculcated. Humility, again, holds a no less prominent place among Buddhist graces than among the Christian. The Buddhist saints are to conceal their good works, and display their faults. As the outward expression of this sentiment of humility, Gautama instituted the practice of confession. Twice a month, at the new and at the full moon, the monks confessed their faults aloud before the assembly. This humiliation and repentance seems the only means of expiating sin that was known to Gautama. Confession was exacted of all believers, only not so frequently as of the monks. The edicts of Piyadasi recommend a general and public confession at least once in five years. The practice of public confession seems to have died out by the time of Hiouen-Thsang's visit to India.

Such are the leading features of the moral code of the Buddha, of which, even with its evident crudities and exaggerations, it has been said, that 'for pureness, excellence, and wisdom, it is only second to that of the Divine Lawgiver himself.' But the original morality of Buddhism has, in the course of time, been disfigured by many subtilties, puerilities, and extravagances, derived from the casuistry of the various schools of later times; as the casuistry of the Jesuits, for instance, perverted many of the precepts of Christianity. The theory on which the

Buddha founds his whole system gives, it must be confessed too much scope to such perversions; for, on that theory, truth is to be spoken, self to be sacrificed, benevolence to be exercised, not for the sake of the good thus done to others, but solely for the effect of this conduct on the soul of the actor, in preparing him for escape from existence. The virtue was selfishness unmixed. To teach men 'the means of arriving at the other shore,' was another expression for teaching virtue; and that other shore was annihilation. On this principle, the Buddhist casuist can, like the Jewish, render of none effect the universal law of charity and the duty of respecting and aiding parents, on which the Buddha laid such stress. Thus, a Bikshu—that is, one who has engaged to lead a life of self-denial, celibacy, and mendicancy, and is thus on the high road to Nir-

Colossal Gautama near Amarapura, Burmah.

vana—is forbidden to look at or converse with a female, lest any disturbing emotion should ruffle the serene indifference of his soul; and so important is this, that 'if his mother have fallen into a river, and be drowning, he shall not give her his hand to help her out; if there be a pole at hand, he may reach that to her; but, if not, she must drown.'—*Wilson.*

Contemplation and science or knowledge (i. e., of the concatenation of causes and effects) are ranked as virtues in Buddhism and hold a prominent place among the means of attaining Nirvana. It is reserved, in fact, for abstract contemplation, to effect the final steps of the deliverance. Thought is the highest faculty of man, and, in the mind of an Eastern philosopher, the mightiest of all forces. A king who had become a convert to Buddhism is represented as seating himself with his legs crossed, and his mind collected and cleaving, with the thunderbolt of science, the 'mountain of ignorance,' he saw before him the desired state. It is in this cross-legged, contemplative position that the Buddha is almost always represented—

that crowning intellectual act of his, when, seated under the Bo-tree (q. v), he attained the full knowledge of the Buddha, saw the illusory nature of all things, broke the last bonds that tied him to existence, and stood delivered for evermore from the necessity of being born again, being considered the culmination of his character, and the highest object of imitation to all his followers.

'Complete' Nirvana or extinction cannot, of course, take place till death; but this state of preparation for it, called simply Nirvana, seems attainable during life, and was, in fact, attained by Gautama himself. The process by which the state is attained is called *Dhyana*, and is neither more nor less than ecstasy or trance, which plays so important a part among mystics of all religions. The individual is described as losing one feeling after another, until perfect apathy is attained, and he reaches a region 'where there are neither ideas, nor the idea of the absence of ideas!'

The *ritual* or *worship* of Buddhism—if worship it can be called—is very simple in its character. There are no priests, or clergy, properly so called. The *Sramanas* or *Bikshus* (mendicants) are simply a religious order—a kind of monks, who, in order to the more speedy attainment of Nirvana, have entered on a course of greater sanctity and austerity than ordinary men; they have no sacraments to administer or rites to perform for the people, for every Buddhist is his own priest. The only thing like a clerical function that they discharge, is to read the scriptures or discourses of the Buddha in stated assemblies of the people for that purpose. They have also everywhere, except in China, a monopoly of education; and thus in Buddhist countries education, whatever may be its quality, is very generally diffused. In some countries, the monks are exceedingly numerous; around Lhassa in Tibet, for instance, they are said to be one-third of the population. They live in *viharas* or monasteries, and subsist partly by endowments, but mostly by charity. Except in Tibet, they are not allowed to engage in any secular occupation. The vow is not irrevocable. This incubus of monachism constitutes the great weakness of Buddhism in its social aspect. For further particulars regarding Buddhist monks and monasteries, as well as the forms of Buddhist worship generally, see the respective titles of the countries where the religion prevails: also see LAMAISM.

The adoration of the statues of the Buddha and of his relics is the chief external ceremony of the religion. This, with prayer and the repetition of sacred formulas, constitutes the ritual. The centres of the worship are the temples containing statues, and the topes or tumuli erected over the relics of the Buddha, or of his distinguished apostles, or on spots consecrated as the scenes of the Buddha's acts. The central object in a Buddhist temple, corresponding to the altar in a Rom. Cath. church, is an image of the Buddha, or a dagoba or shrine containing his relics. Here flowers,*

* The quantity of flowers used as offerings is prodigious. A royal

fruit, and incense are daily offered, and processions are made with singing of hymns. Of the relics of the Buddha, the most famous are the *teeth* that are preserved with intense veneration in various places. Hiouen-Thsang saw more than a dozen of them in different parts of India; and the great monarch Ciladitya was on the eve of making war on the king of Cashmere for the possession of one, which, though by no means the largest, was yet an inch and a half long. The tooth of the Buddha preserved in Ceylon, a piece of ivory about the size of the little-finger, is exhibited very rarely, and then only with permission of the English government—so great is the concourse and so intense the excitement. See CEYLON.

There appears at first sight to be an inconsistency between this seeming worship of the Buddha, and the theory by which he is considered as no longer existing. Yet the two things are really not irreconcilable; not more so, at least, than theory and practice often are. With all their admiration of the Buddha, his followers have never made a god of him. Gautama is only the last Buddha—the Buddha of the present cycle. He had predecessors in the cycles that are past (24 Buddhas of the past are enumerated, and Gautama could even tell their names): and when, at the end of the present cycle, all things shall be reduced to their elements, and the knowledge of the way of salvation shall perish with all things else; then, in the new world that shall spring up, another Buddha will appear, again to reveal to the renascent beings the way to Nirvana. Gautama foretold that Mitraya, one of his earliest adherents, should be the next Buddha * (the Buddha of the future), and he gratified several of his followers with a like prospect in after cycles. The Buddha was thus no greater than any mortal may aspire to become. The prodigious and supernatural powers which the legends represent him as possessing, are quite in accordance with Indian ideas; for even the Brahmans believe that by virtue, austerities, and science, a man may acquire power to make the gods tremble on their thrones.

The Buddha, then, is not a god; he is the ideal of what any man may become; and the great object of Buddhist worship is to keep this ideal vividly in the minds of the believers. In the presence of the statue, the tooth, or the footprint, the devout believer vividly recalls the example of him who trod the path that leads to deliverance. This veneration of the memory of Buddha is perhaps hardly distinguishable, among the ignorant, from worship of him as a present god; but in theory, the ritual is strictly commemorative, and does not necessarily involve idolatry, any more than the garlands laid on the tomb of a parent by a pious child. See TOPE.

---

devotee in Ceylon, in the 15th c., offered on one occasion 6,480,320 flowers at the shrine of the tooth. At one temple it was provided that there should be offered 'every day 100,000 flowers, and each day a different flower.'

* One who is on the way to become a supreme Buddha, and has arrived at that stage when he has only one more birth to undergo, is styled a *Bodhisatva* (having the essence of knowledge); a mere candidate for Nirvana is an *arhat* (venerable).

The prayers addressed to the Buddha are more difficult to reconcile with the belief in his having ceased to exist. It is improbable, indeed, that the original scheme of Buddhism contemplated either the adoration of the statutes of the Buddha, or the offering of prayers to him after his death. These are an after-growth—accretions upon the simple scheme of Gautama, and in a manner forced upon it during its struggle with other religions: for a system of belief that seeks to supplant other systems, finds itself enticed to present something to rival and outdo them, if possible, at every point. Even the Christian church, in the middle ages, adopted with this view many of the rites and legends of paganism that were quite inconsistent with its own character; merely casting over them a slight disguise, and giving them Christian names. Prayer, too, is natural to man—an irrepressible instinct, and had to be gratified. And then the inconsistency in uttering prayers when there is no one to hear or answer, glaring as it appears to us, is by no means great to the Eastern mind. Prayers, like other sacred formulas, are conceived less as influencing the will of any superior being to grant the request than as working in some magical way—producing their effects by a blind force inherent in themselves. They are, in short, mere incantations or charms. Even the prayers of a Brahman, who believes in the existence of gods, do not act so much by inclining the deity addressed to favor the petitioner, as by compelling him through their mysterious potency—through the operation of a law above the will of the highest gods. The Buddhist, then, may well believe that a formula of prayer in the name of 'the Venerable of the world' will be potent for his good in this way, without troubling himself to think whether any conscious being hears it or not.

The element in Buddhism which more than any other, perhaps, gave it an advantage over all surrounding religions, and led to its surprising extension, was the spirit of universal charity and sympathy that it breathed, as contrasted with the exclusiveness of caste. In this respect it held much the same relation to Brahmanism that Christianity did to Judaism. It was, in fact, a reaction against the exclusiveness and formalism of Brahmanism—an attempt to render it more catholic, and to throw off its intolerable burden of ceremonies. Buddhism did not expressly abolish caste, but only declared that all followers of the Buddha who embraced the religious life were thereby released from its restrictions; in the bosom of a community in which all equally renounced the world, high and low, the twice-born Brahman and the outcast, were brethren. This was the very way that Christianity dealt with the slavery of the ancient world. This opening of its ranks to all classes and to both sexes—for women were admitted to equal hopes and privileges with men, and one of Gautama's early female disciples is to be the supreme Buddha of a future cycle—no doubt gave Buddhism one great advantage over Brahmanism. The Buddha, says M. Müller, 'addressed himself to castes and outcasts. He promised salvation to all; and he commanded his disciples to preach his doctrine in all places and to all

men. A sense of duty, extending from the narrow limits of the house, the village, and the country, to the widest circle of mankind, a feeling of sympathy and brotherhood toward all men, the idea, in fact, of humanity, were first pronounced by Buddha.' This led to that remarkable missionary movement, already adverted to, which, beginning B.C. 300, sent forth a succession of devoted men, who spent their lives in spreading the faith of Buddha over all parts of Asia.

In the characteristic above mentioned, and in several other respects, Buddhism presents resemblances to Christianity, and this in spite of the perverse theory on which it is founded. The analogies and coincidences, though not reaching to any depth, are numerous and striking to a casual observer.

It is easy to make Buddhism ridiculous, by giving prominence to the extravagances and the almost inconceivable puerilities and absurdities with which the system has been overloaded. But this is not to depict, it is to caricature. It is neither wise nor good for Christian writers to treat of heathen religions in such fashion. The only fair—the only *true* account of any religion, is that which enables the reader to conceive how human beings may have come to believe it and live by it. See Oldenberg's excellent treatise, *Buddha* (1881; Eng. transl. 1882); Spence Hardy's *Manual of Buddhism;* Koeppen's great work, *Die Religion des Buddha* (1857); *Buddhism*, by Rhys Davids (1879); Saint-Hilaire's *Le Bouddha;* Max Müller *On Buddhist Nihilism;* and the works of Eitel, Schlagintweit, and Alabaster on Chinese, Tibetan, and Siamese Buddhism, respectively.

BUDDING; sometimes called INOCULATION: an operation analogous to GRAFTING (q.v.), of which indeed it is merely a particular mode, in which a leaf-bud is used as a graft instead of a young shoot. It is generally preferred for trees which are apt to throw out much gum when wounded, as the plum, cherry, peach, apricot, and stone-fruits in general, also for roses and many other flowering shrubs. The time for it is when the bud is perfectly

formed, about or a little after midsummer. The subjoined cut represents the various parts in budding: *a* is the bud cut out, with a shield of bark attached to it; *b*, the stem, with a slit in the bark to receive the shield attached to the bud; *c*, the bud inserted and the leaf cut away. The bud to be used is taken, by means of a sharp knife, from the

branch on which it has grown—a branch of the same season—a small portion of the bark and young wood being taken with it, extending to about half an inch above and three-quarters of an inch below the bud. The woody part is then separated from the bark and bud; but care is to be taken that the bud itself is not injured. which, however, is always the case when the operation is attempted before the bud is sufficiently matured, and is indicated by a hollow left at the bud when the wood has been removed. A longitudinal and a transverse cut are made in the bark of the stock intended to receive the bud, in the form of the letter T; the bark is raised on both sides, for which purpose the handle of the *budding-knife* generally terminates in a thin ivory blade, and the bud is inserted, the bark attached to the bud being cut across so as to join exactly to the transverse cut in that of the stock, that the bud may be nourished by the descending sap. The leaf in the axil of which the bud grew is cut off and the leaf stalk used as a handle. The newly-inserted bud is for a time preserved in its place, and prevented from too much access of air by strands of bass matting. The process just described is distinctively called *shield-budding*, and is the most common method. Other methods are occasionally employed, as *reversed shield-budding*, in which the incisions are in the form of the letter T reversed, which is sometimes practiced with trees of the orange family and others in which there is a very great flow of descending sap; and *scallop-budding*, in which a thin slip of bark is removed from the stock and a similar slip bearing the bud is placed upon it, the upper edge and one of the lateral edges being made to fit exactly. Scallop-budding may be performed in spring, and if it fail, the ordinary method may be resorted to in summer. Budding is also sometimes performed by taking a tube of bark with one or more buds from a small branch and placing it upon a branch of similar thickness in the stock, from which the bark has been removed.

BUDDLE, n. *bŭd'dl:* among *miners*, a wooden frame used for washing ore: V. to wash ore. BUDDLING, imp. *bŭd'dlĭng.* BUDDLED, pp. *bŭd'dld.*

BUDDLEA, *bŭd'lĕ-a:* genus of shrubs of the nat. ord. *Scrophulariaceæ*, of which many species are known, all natives of the warmer parts of the world, and some of them admired for their beautiful flowers. *B. Neemda* is praised as one of the most beautiful plants of India. *B. globosa*, native of Chili, with downy branches, lanceolate leaves, and globose heads of orange-colored flowers, is hardy enough to endure the climate of most parts of England, where it has become a common ornament of gardens.

BUDE: small but growing watering-place on the n.

coast of Cornwall, Eng., 18 m. n.w. of Launceston. The cliffs are grand, and the country around is interesting.

BUDE BURNER—BUDE LIGHT, *būd:* so called from the name of the residence of the inventor, Mr. Gurney. The burner consists of two, three, or more concentric argand burners, each inner one rising a little above the outer. On the same principle, a powerful light is produced by a number of flat flames disposed in concentric circles like the petals of a rose.

The BUDE LIGHT depends upon introducing oxygen into the centre of the flame instead of air, as in the common argand. A light of dazzling brilliancy is thus produced.

BUDGE, v. *bŭj* [F. *bouger*, to move—from It. *bulicārĕ;* mid. L. *bullĭcārĕ*, to bubble often: Bret. *boulj*, movement: Icel. *bullt*, frequent motion]: to move off a place; to stir. BUD'GING, imp. BUDGED, pp. *bŭjd.* BUD'GER, n. one who.

BUDGE, n. *bŭj* [Russ. *push'*, fur-skins; *pushit'*, to line with fur]: dressed skin or fur of lambs, formerly used as an edging or ornament, especially of scholastic habits: ADJ. in *OE.*, solemn, like a doctor in his fur; stern. BUDGE-BACHELORS, a company of men dressed in long gowns lined and trimmed with budge-fur, who formerly accompanied the lord mayor of London in his inaugural procession. BUDGE-BARREL, n. a small barrel with one head, the other having a loose leathern cover, used in carrying powder in a siege.

BUDGET, n. *bŭj'ĕt* [F. *bougette*, a leather bag: It. *bolgetta*, a leathern bucket—from *bulga*, a skin]: a bag with its contents; a stock or store or compact collection of things. 'Water-budgets' or buckets were a very honorable blazon on a coat-armorial, as being generally conferred in honor of some valiant feat for supplying an army with water.

The term, 'The Budget,' is in Britain, from long usage, applied to the annual financial scheme of the British nation, a miscellaneous collection of matters which aggregate into the yearly statement to parliament by the chancellor of the exchequer. It contains two leading elements—a statement how the nation's account of charge and discharge stands in relation to the past, and an explanation of the probable expenditure of the ensuing year, with a scheme of the method in which it is to be met, whether by the existing or new taxes, or by loan. The statement of the budget is always an important, sometimes an exciting, occasion.

BUDHA'NUH: town of India, in the British dist. of Mozuffurnuggur, N.W. Provinces, on the route from Kurnoul, or Meerut, 43 m. s. from Kurnoul. The surrounding country is wooded and well cultivated, and

the bazaar of the town is well supplied. Pop. about 10,000.

BŬDOS HEGY, *bü-dŏsh' hĕj:* mountain belonging to the Carpathians, on the e. border of Transylvania; lat. 46° 12′ n., long. 25° 40′ e. It is quite isolated, steep, and of conical shape, densely wooded on the lower slopes, and has an elevation of 7,340 ft. It has numerous caverns, that emit sulphurous exhalations, and from its base issue strong sulphur springs.

BUDWEIS, *bôd'vīs:* town of Bohemia, on the Moldau, about 77 m. s. of Prague. B. is well built, is partially fortified, and has an old cathedral, manufactures of woolens, stoneware, machines, lead-pencils, saltpetre, etc. It has also a brisk trade in grain, wood, coals, and salt. There are numerous schools, for education in the Bohemian and in the German tongue. The Slavic name of B. is *Budejowice.* In the neighborhood is an old feudal fortress, the *Schloss Frauenberg,* one of the seats of Prince Schwarzenberg, and a fine new Gothic castle also belonging to the same nobleman. Here he keeps herds of wild swine for the chase. Pop. (1900) 39,328.

BUDWEISER, *i.e.,* Budweiser beer, *bôd' vīser:* beer brewed in Budweis, Bohemia.

BUEL, *bū'ĕl,* Clarence Clough, American editor and author: b. Laona, Chautauqua County, N. Y., 1850, July 29. He was connected with the New York *Tribune* from 1875 to 1881, when he joined the staff of the *Century Magazine* and, in 1883, in conjunction with Robert Underwood Johnson, began the editing of the celebrated *Century War Articles,* which were afterward expanded into the notable *Battles and Leaders of the Civil War* (1887).

BUEL, Samuel, American clergyman: b. Troy, N. Y., 1815, June 11; d. New York, 1891, Feb. 1. He was graduated from Williams College in 1833, and from the General Theological Seminary, New York, in 1837. He was rector successively in Marshal, Mich., Schuylkill Haven, Pa., Cumberland, Md., Poughkeepsie, N. Y., and New York until 1866. From 1866 to 1869 he was professor of ecclesiastical history in the Seabury Divinity School, Faribault, Minn., and professor of divinity there, 1869–71, when he was elected to the chair of systematic divinity and dogmatic theology in the General Theological Seminary, a position which he held until his retirement as professor emeritus in 1888. He wrote *The Apostolical System of the Church Defended, in a Reply to Dr. Whately on the Kingdom of Christ* (1844); *Eucharistic Presence, Sacrifice and Adoration* (1874); *A Treatise of Dogmatic Theology* (1890); and translated F. H. Reusch's *Conference at Bonn; Proceedings, August,* 1875, *Between Old Catholics, Orientals, Members of the Anglican and American Churches, from Europe and America* (1876).

BUELL, Don Carlos, American military officer: b. Lowell, Ohio, 1818, March 23; d. near Rockport, Ky., 1898, Nov. 19. He was graduated at West Point in 1841, and served in the Mexican War. When the Civil War broke out he was adjutant-general of the regular army, and was made a brigadier-general of volunteers and attached to the Army of the Potomac. In 1861, November, he succeeded Gen. W. T. Sherman in command of the department of the Ohio. He resigned from the volunteer service on 1864, May 23, and on June 1 following, also resigned his commission in the regular army. He was president of the Green River (Ky.) Iron Works from 1865 to 1870, when he engaged in coal mining. From 1885 to 1890 he served as United States pension agent at Louisville.

BUELL, Marcus Darius, American Methodist clergyman: b. Wayland, N. Y., 1851, Jan. 1. He was graduated at New York University, 1872; studied theology at Boston University, and at the universities of Cambridge, England, and Berlin, Germany, being admitted to the New York East Conference of the Methodist Church, 1875. He was pastor at Portchester, N. Y., Brooklyn, N. Y., and Hartford, Conn., from 1875 to 1884, when he was appointed professor of New Testament Greek and exegesis in Boston University. Since 1889 he has been dean of the theological faculty there. He has written *Studies in the Greek Text of the Gospel of St. Mark* (1890), etc.

BUENA VISTA, *bū'na vĭs'tâ:* small settlement on the San Juan river, in the state of Coahuila, Mexico; 90 m. s.w. of Monterey, 10 m. from Saltillo. It consists for the most part of mountainous ridges, defiles, and ravines. The place has a general interest from the fact that a battle was fought here, 1847, Feb. 22, 23, between United States forces under Gen. Taylor and Mexican forces under Gen. Santa Anna. The latter had 20,000 men, while the former had only 5,200 a large portion of whom were raw volunteers. After two days' sharp fighting Santa Anna was defeated with a loss of about 2,000; Taylor's loss being only 267 killed and 479 wounded and missing. The result was due mainly to the superior effectiveness of Taylor's artillery. This action is sometimes called the battle of La Angostura, from the name of a pass occupied by a detachment of Taylor's army at the beginning of the battle, 1½ m. n.e. of Buena Vista.

BUEN AYRE, *bwĕn ī'rā* (Spanish), or Bon Air, *bŏng ăr* (French): island in that subdivision of the West Indies which runs parallel with the coast of Venezuela; lat. 12° 20′ n., long. 68° 27′ w., 30 m. e. of Curacao, which, like B. A., belong to the Dutch. Buen Ayre produces cattle and salt. It measures 20 m. by 4, and has a moderately good harbor on its leeward or s.w. side. Pop. abt. 4,000.

BUENOS AYRES, *bō'nŭs ā'rĭz:* province of the Argentine Confederation in S. America, of which the city Buenos Ayres is capital; extends along the Atlantic, from the mouth of the Plata to that of the Rio Negro on the 41st parallel; on the n.e. it is washed by the Plata and the Parana as far as the Arroyo del Medio; on the n. and the adjacent section of the w. it touches the province of Santa Fé. Elsewhere its borders cannot be defined, constantly advancing, by slow and perilous steps, into the domain of the aborigines, for here the contest is not with the wilderness itself, which is a boundless prairie, but with its tenants, who, having an unlimited supply of horses for all purposes, are secured in their every foray alike against famine and fatigue. The area is reported at 117,777 sq. m. Besides the existing province of the name it at one time comprised Uruguay or Banda Oriental, Paraguay, Bolivia, and the Argentine Confederation, being originally an appendage of Peru, under the immediate command of a capt. gen., and becoming, 1775, a separate vice-royalty of itself. Though the first three of these four divisions broke off chiefly in connection with the revolutionary struggle, yet the fourth continued, till 1853, to recognize the city of Buenos Ayres as its head; and the inland states endeavored both by war and diplomacy to re-annex the maritime province to the republic, till 1860, June, their object was obtained, and Buenos Ayres became once more a province in the Argentine Confederation.

The country is so nearly to a plain, that most of the rain which falls is either absorbed or evaporated, or lost in salt-lakes, comparatively little drainage entering the Parana or the Plata. The climate, though on the whole healthful and agreeable, is yet not steady or uniform. Every wind, in general, has, to a remarkable degree, its own weather—sultriness coming from the n., freshness from the s., moisture from the e., and storm from the w.; and, besides the periodical heats of every summer, successive years of more than ordinary drought occur. Agriculture, properly so called, is followed chiefly in the more temperate and humid districts of the e. coast; while the interior presents almost uninterrupted pasturage to countless herds of horses and cattle. Under these circumstances the business of grazing and hunting combined occupies or interests the great bulk of the population—a business that renders the province, whether as to the disposal of its productions or as to the supply of its wants, peculiarly dependent on that external commerce, which, throughout Spanish America, has naturally been identified with political freedom. As the Indians are intractable, and the Africans, few in number, are principally menials, immigration from Europe has been not only tolerated by public opinion, but also encouraged by legislative enactment, in spite of national jealousies and sectarian prejudices. Moreover a comparatively congenial climate, as a recom-

mendation to foreigners, has powerfully seconded the efforts of liberality and patriotism. It is perhaps mainly owing to this cause, common to Chili and to Buenos Ayres, that these two districts, notwithstanding their full share of wars and troubles, have so decidedly outstripped the other fragments of the same colonial empire in all the elements of liberty and civilization. Hence their higher importance in the eyes of Europeans in general, and of Englishmen in particular. Buenos Ayres is the largest, most populous, and most flourishing of the provinces which comprise the Argentine Confederation. Numerous railways traverse it, emanating from the city of Buenos Ayres, and extending to other parts of the republic. Pop. (1900) 1,140,067.

BUENOS AYRES, the federal capital and principal commercial port of the Argentine Republic; situated on the right bank of the La Plata River, 172 m. from its mouth; lat. 34° 36′ 21″ s.; long. 58° 21′ 33″ w.; 5,220 m. from London, 4,370 m. from New York and 125 m. w. of Montevideo. The city covers an area of about 175 sq. m., its general plan being quadrangular. The chief streets are over 30 ft. wide and the blocks over 400 ft. in length, paved with asphalt, wood and granite, lighted with electricity, and lined with rows of plane trees. The Avenue de Mayo is 100 ft. wide and a m. and a half long; at its eastern end is the Plaza de Mayo (4 acres) about which are the 'Casa Rosada,' or executive palace, the old House of Congress, the commercial exchange, the municipal buildings, the Cathedral, the 'Bank of the Nation,' and other large edifices. At the extreme western end is the recently inaugurated Palace of Congress, erected at a cost of $6,000,000. The district of the Boca (pop. 100,000), upon the left bank of the Riachuelo, and the district of Avellaneda (pop. 12,000), in front of Barracas, to the s., are connected by a draw-bridge and other devices.

The harbor has recently been deepened and extended at a cost of $35,000,000, so that it now occupies a superficial area of 165 acres and consists of outer and inner harbor, with channels from 17 to 22 ft. deep, and drydocks, wharves, shipyards, warehouses, grain elevators, etc. About $17,000,000 more will be expended in further enlarging the harbor and increasing its facilities. Facing the wharves is the Central Fruit Market, the largest warehouse in the world, occupying an area equal to 9 sq. blocks in New York City. It is the principal exchange for all business pertaining to the exportation of fruits of the country. Buenos Ayres stands in 11th place among the harbors of the world in the value of its commerce and is second after New York in foreign commerce in all America. In 1905 there entered and cleared 27,279 steamships and sailing vessels aggregating 10,771,947 tons. The city receives 84 per cent. of the imports of the entire country and ships 51 per cent. of the exports.

The city is not an industrial city, there being not more than 90,000 workmen in its factories. In 1904 there were 8,877 industrial establishments, capitalized at $49,300,000, and having an annual output valued at $91,000,000. The principal manufactures are hides, woods, metals, brick, chemical products, furniture, carpets, construction materials, clothes, preserved foods, etc.

There are 16 banks of discount in Buenos Ayres with a combined capitalization of $80,000,000; of those 10 are foreign, representing all the prinicpal cities of the world except New York, though in 1905 the business transacted with the United States amounted to about $45,000,000. The chamber of commerce in 1904 transacted business to the amount of $174,061,251, and the clearing house passed through $2,875,924,788.35. The municipal taxes amounted to $7,500,000.

Buenos Ayres has 79 parks covering an area of 2,320 acres; a large Zoo and an excellent Botanical Garden. In 1904 there were 238 public schools with 117,483 scholars enrolled and 2,973 teachers (2,050 women) in the elementary grade. In secondary institutions (except the normal) there were 2,638 pupils. In the seven normal schools there were 2,282 pupils; in the business college 668 pupils; and in the University 2,380 students. There are also several libraries, evening schools, and a school of music. The city contains about 18 hospitals and numerous churches, charitable institutions, educational and philanthropic associations, theatres, etc.

The sanitary system (running water and sewers) has cost the city $46,875,180. The sewage is handled by the circulating or dynamic sewage system. The drainage works cost $35,000,000. The water-works consists of two tunnels 18,702 ft. in length with two pumps capable of raising water 49.2 ft. In 1904 there were 315 m. of street car lines of which 166 were electric and 149 horse.

Buenos Ayres is governed by an Intendent and a deliberating council appointed by the national executive authority and the city therefore can hardly be said to be self-governed. In 1905 the expenditures amounted to $8,126,660. In 1906 the population was 1,111,000.

Buenos Ayres was founded 1535; but was twice destroyed by the Indians. In 1806, to the glory of B., a British force, which had just captured the city, was obliged to surrender; and in 1807, another, which attempted to recover the place, was repulsed with heavy loss; and these successes over so formidable a foe emboldened the colonists, three years afterward to throw off the yoke of Spain. See also ARGENTINE REPUBLIC.

BUFF, n. *bŭf* [F. *buffle*, the wild ox or buffalo—from mid. L. *bufălus*—from *bu'bălus*, a buffalo: Russ. *buivol:* It. *buffalo*]: a sort of soft leather prepared originally from the skin of the buffalo; a color near to yellow; yellow substance on blood in inflammation; ADJ. of the color of buff-leather. BUFFS. a regiment of soldiers, so

called from their buff-colored facings. BUF'FY, a. *-fi*, pertaining to the color on the surface of blood; resembling buff. BUFFY COAT, or BUFF, a grayish or colorless crust appearing on blood drawn from the body in inflammatory diseases, or normally on blood drawn from the horse and many other animals.

BUFF, n. *bŭf* [Low Ger. *buffen*, to strike: OF. *bufer* or *buffer*, to strike: It. *buffetto*, a cuff]: in OE., a blow; V. to strike: see BUFFET 1.

BUFFALO, *bŭf'fa-lō*, N. Y.: city, port of entry, railroad and commercial center, capital of Erie co., and in population and wealth the second city in the State and eighth in the United States. It has an exceptionally advantageous location for a large commerce, with a water-front of 10 miles on Lake Erie and Niagara River and one of the most commodious harbors on the lakes. The location is 24 miles s. of Niagara Falls, 297 by rail w. of Albany, 425 n. w. of New York, 499 w. of Boston, and 540 e. of Chicago. Originally the city began at the mouth of Buffalo Creek, but it has spread mainly toward the n. and e., up a gradual rise to a plateau 80 feet above the lake and 620 above sea-level. There are more than 700 miles of streets, about one-half of which are paved with asphalt, the remainder with stone and macadam. The streets are wide and regularly laid out, and very beautifully shaded and decorated with shrubbery.

History.—The site of the city was originally a basswood forest, in the midst of which the Kahkwas tribe of Indians had built their huts and wigwams and lived mainly by fishing along the creek. Previous to 1615 these Indians were exterminated by the Iroquois, and for more than 125 years the place remained uninhabited. In 1679 La Salle passed the place in his 60-ton sloop, the *Griffin*, which he had built at Cayuga Creek below, and which was the first vessel to navigate the lakes by means of sails. Eight years later Baron La Hontan recommended the place as a suitable site for a fort to protect the fur trade on the Niagara, and he marked the spot as 'Fort Supposé,' but his recommendation was disregarded. In the campaign of 1764 Col. Bradstreet, recognizing the strategic importance of the place, built a fort on the opposite side of the river, which he called Fort Erie, but the war of the Revolution soon intervened, and the fort was abandoned and forgotten. In 1780 the Senecas, driven from their old haunts by Sullivan's campaign, settled along the creek inland, and the next winter a family of white people who were captive among them heard them call the creek by a name which they understood to mean 'Buffalo,' derived by the Indians from the herds of those animals which had formerly congregated at the salt licks to the eastward. This Indian settlement was thereafter known as 'the village of the Buffalo,' but when the whites began to come they shortened it to the simple word 'Buffalo,' by which the place has ever since been known. The

land had formed a part of the grant of James I. to the Plymouth Company in 1625, and that of Charles II. to the Duke of York in 1664. This conflict of title led to a dispute between Massachusetts and New York, which was compromised in 1786; and ultimately the Holland Company became patentees in trust in 1792, and owners in fee by legislative enactment in 1798. Meanwhile, in 1789, a trader named Cornelius Winn had settled there, and others came at later periods, until in 1797 a little settlement of half a dozen houses had grown up on the site of the old Indian village. That year the first white child, a girl, was born. The population increased slowly, until in 1803 a village was laid out. This was done at the suggestion of Joseph Ellicott, who is regarded as the founder of Buffalo. He had assisted his brother Andrew in laying out the City of Washington, and was convinced that here was the site for another great city. He called the place New Amsterdam, and named the streets for various members of the town company, but the settlers disregarded all his names, as well as the ox-bow line which he had drawn for Main street, and on which his house was to be located. It seems to have been his purpose to lay out a town on the model of the national capital, with some improvements and variations, which, however, did not suit the taste of the inhabitants. The growth of the town dates from this period. In 1810 it was incorporated, and the following year the first newspaper, the Buffalo *Gazette*, was established there. In 1813 the place was reincorporated, and on the 19th of December of that year it was captured by the British under General Riall, and all the houses except seven or eight burnt. They returned on the 1st of January and destroyed all the remainder except three. The site of the town was now a desolation, but the inhabitants reclaimed their homes as soon as the enemy had departed, although owing to the progress of the war (1812–15) the town was not fully rebuilt until the latter year. On the 10th of the preceding April General Scott had placed it under military rule, in order to secure greater safety for the citizens. In 1818, the third year after the close of the war, the first steamboat, *Walk-in-the-Water*, was launched, affording a striking example of the rapid growth of the city. But meanwhile a rival town, called Black Rock, had been established a little further down the river, and for many years the rivalry between the two places was sharp and bitter. The newer town had some advantage in being the point where the ferry crossed to Canada, but in 1825, after a fierce struggle, B. secured the terminal of the Erie Canal, and in five years its inhabitants increased from 2,412 to more than 8,000. In 1832 Buffalo annexed Black Rock, and the old rivals became one. B. has given two presidents to the United States, Millard Fillmore and Grover Cleveland, the latter having also been mayor of the city in 1882. From May 1 to Nov. 1, 1901, the Pan-American Exposition was held

here, and on the 6th of Sept., while in attendance on the fair, President McKinley was foully assassinated.

Trade and Commerce.—Buffalo's position as the eastern terminal of the commerce of the Great Lakes, and the distributing point from the East to its ports, has made it the greatest of the lake cities except Chicago and Cleveland, and one of the great world-ports in the volume and variety of produce trans-shipped, although ice-bound for one third of the year. In 1902, 4,781 vessels arrived at this port, with a gross tonnage of over 6,000,000; and the customs receipts were over $900,000. Naturally, its foremost handlings are of western produce, grain, flour, provisions, and live stock; its average annual receipts of grain, though varying with the crop, are about 150,000,000 bushels; of flour, 14,000,000 barrels. Next to this is its live-stock business; it handles more horses and sheep than any other American port, and ranks among the first in cattle and swine. It receives some 15,000,000 pounds of fish yearly, largely from Georgian Bay off Lake Huron, and sends it to inland parts not only East, but as far west as the Rocky Mountains. Lumber is another immense interest, its receipts amounting from 150,000,000 to 250,000,000 feet a year; and it receives some 1,500,000 tons of iron ore. Of the last two a large part goes to Tonawanda, whose business, however, is really part of Buffalo's. The coal traffic is also enormous: some 10,000,000 tons are received yearly by rail, two thirds anthracite, of which about 3,000,000, nearly all anthracite, is shipped westward by water. About 100,000 tons of salt are among its exports, and nearly $10,000,000 worth of packed meat. The total export trade is now over $16,000,000 a year.

This immense development has been made possible by a vast co-operation of United States, State, and municipality in facilities for handling the business—breakwaters, stone piers, basins, canals, railroads, etc. Originally, as with all the lake ports, the harborage was only the shallow mouth of a small river, Buffalo Creek, navigable now for two miles inward. But the government has built a great series of stone and cement breakwaters, four miles long, costing over $2,000,000, and forming an inner and an outer harbor, the best on the lakes; this is extended to Stony Point, four miles above the mouth of the creek. The State has built Erie Basin, with a breakwater and stone docks, at the end of Erie Canal just below the mouth of the creek; and the city has deepened the creek and built a ship canal two miles long between it and the lake, one of two such, at the end of which are the Lehigh coal docks. No less than 16 steamship and steamboat lines run from Buffalo to different points on the lakes, besides summer excursion routes. The Welland Canal, about 20 miles west, across the neck of land between Erie and Ontario, connects it with the latter and the St. Lawrence. The Erie Canal makes a waterway through the heart of the State

to the Hudson River. As to railroads, it is the terminal of the main line or some spur of every trunk road from Philadelphia to Quebec; from the east, in the United States, the New York Central, main line and West Shore; Erie; Lehigh Valley; Delaware, Lackawanna & Western; Pennsylvania; Buffalo, Rochester & Pittsburg; Buffalo & Susquehanna; from the west, the Lake Shore & Michigan Southern; Michigan Central; New York, Chicago & St. Louis; Wabash; from Canada, Canadian Pacific; Grand Trunk; Canada Southern. There are nearly 50 grain elevators, fixed and floating and transfer towers, with a storage capacity of 28,000,000 bushels, and able to take care of 5,000,000 bushels a day. The chief of these, the Great Northern, has a capacity of 3,000,000 bushels. The first elevator in the world was built here in 1843. The largest coal pocket in the world is that of the D., L. & W. here, 5,000 feet long; the coal docks can handle 29,000 tons a day; the railroad coal-stocking trestles are in the east part. Their stock yards, 75 acres in extent, are in East Buffalo.

Manufactures.—Two great advantages of Buffalo in manufacturing are natural gas, for which the city has laid mains; and the electric power furnished from Niagara, whose tunnels are within 20 miles. At present about 50,000 persons are employed in manufacturing industries in the city, in 4,000 establishments. By the census of 1900, the figures were: Establishments, 3,962; capital, $103,939,655; employees, 476,902; wages paid, $19,915,817; cost of materials, $73,359,466; value of products, $122,230,061. The principal industries apart from food, mason and carpenter work, tinsmithing and jobbing, etc., were—wholesale slaughtering and meat packing, $9,631,187; foundry and machine-shop products, $6,816,057,—but to this should be added iron and steel, architectural and ornamental iron work, and hardware, $3,685,063, making a total of $10,501,120, for iron products altogether, or the most important single branch; the Lackawanna Steel Company, capitalized at $40,000,000, has the largest and most capacious individual plant in the world, with a separate breakwater a mile long and a capacious private harbor—linseed oil, $6,271,170, partly used in its $753,519 of paint making; malt and malt liquors, $6,229,940; railroad cars, $4,553,333; soap and candles, $3,818,571; flour and grist-mill products, $3,263,697; planing-mill products, $3,095,760; factory-made clothing, $3,067,723; chemicals, $1,939,378; patent medicines and compounds, $1,855,808; leather and leather goods, $1,756,084; factory-made furniture, $1,644,671; besides over $1,000,000 each of carriages and confectionery, and large quantities of jewelry, saddlery and harness, tobacco products, and other articles, embracing some 200 different industries in all. Notice should be taken of fine printing, lithographing, and engraving, in which Buffalo ranks high artistically.

Finances and Banking.—The assessed valuation of the city has increased in 30 years from about $38,000,000 to over $250,000,000, nearly all real estate, with a tax rate of 17.12. The bonded debt is some $16,000,000, with an annual interest charge of about $650,000; but there is a sinking fund of about $1,250,000, and the city owns property valued at about $21,000,000. Also, of this debt, $3,754,382 is for water bonds, on which an income is earned. The city expenses are some $6,000,000 a year. The post-office receipts are over $1,000,000 yearly, and the internal-revenue receipts about $2,000,000. There are nine banks of discount (five national), with about $8,000,000 capital and surplus and $45,000,000 deposits; two trust companies, with $1,400,000 capital and surplus; and four savings banks, with over $35,000,000 deposits and $6,000,000 surplus.

Education and Intellectual Associations.—The city in 1903 had 67 grammar schools, with about 100 school buildings, some 1,300 teachers, and an average attendance of about 60,000; a truant school; 33 Catholic parochial schools, with an estimated attendance of some 20,000; two high schools, third one building—the Central with two annexes, and the Masten Park—with attendance of some 2,400; 25 private schools and academies; and some 20 free kindergartens (partly in connection with the schools), orphan-asylum schools, etc. Of the higher institutions, the chief is Buffalo University, organized in 1845, with affiliated law, medical, and dentistry schools, and a cancer laboratory, 80 professors, and 700 students; others are Niagara University, Canisius' (1870) and St. Joseph's Colleges, the Academy of the Sacred Heart and Holy Angels' Academy (the last four Catholic), the German Martin Luther Seminary (Evangelical Lutheran, 1854), and the Buffalo College of Pharmacy. All the hospitals have training schools for nurses. The Fine Arts Academy (1862) is located in the public library building; the Buffalo Historical Society (1862), with interesting relics and a large library, in the former New York State building of the Exposition of 1901, now belonging to the society; the Buffalo Society of Natural Science (1861), with a valuable museum of natural history, in the Buffalo Library building. There are many other art and literary associations; 8 dramatic and 13 musical clubs, besides 23 social clubs; and 8 theatres.

Libraries.—The two chief ones are the Buffalo Public Library, installed in a handsome new building in 1897, with about 175,000 books and 16,000 pamphlets; and the Grosvenor, for reference only, with 65,000 books and 4,000 pamphlets. Besides these, there are many institutional, private, and special libraries; the chief being that of the Historical Society, with 12,000 volumes and 23,000 pamphlets; others are the Lord Library of 5,000 volumes in the same building; the State Law Library, with about 15,000 volumes; the Catholic Institute, with over 11,500 volumes and 500 pamphlets;

the Medical Library of the University, with 6,000 volumes; the Lutheran and the German Y. M. A., the Polish and the Adam Mickiewicz, the North Buffalo Catholic Association and the St. Michael's Y. M. Sodality, the Erie Railway Employees' Association, the Harugari, etc.

Newspapers.—In 1903 there were published in Buffalo 88 regular periodicals: 11 dailies, 31 weeklies, 6 Sunday, 2 fortnightly, 35 monthly, and 3 quarterly.

Public Parks and Cemeteries.—The park system includes six large parks of 1,149 acres in all, connected by a magnificent system of boulevards, parkways, speedways, and approaches, covering 224 acres, and 74 acres of minor places and squares. Much the largest is Delaware Park, on the north side, of 362 acres, with a lake ('Gala Water') of 46½ acres in the western part; here and in the adjacent grounds the Pan-American Exposition of 1901 was held. It is continued by Forest Lawn Cemetery of 239 acres on the south—by far the greatest of the 26 cemeteries of the city, and containing the monuments to the Indian chief Red Jacket and to President Fillmore—and by the fine grounds of the State Insane Hospital, with 203 acres, on the west. On the southeast is Humboldt Park of 56 acres. Overlooking the lake at the river entrance is 'The Front,' a bold bluff 60 feet high, and the site of Fort Porter, where several companies of United States soldiery are stationed. The Parade Ground here has 48 acres, and is a favorite promenade from its superb view. On the south side of the creek are South Park, 155 acres; Cazenovia Park, 106 acres; Riverside Park, 22 acres; and Stony Point Park, 22½ acres on the lake front. There are several attractive parks and squares in the centre of the city, among them Lafayette, Niagara, Franklin, Washington, and Delaware. Lafayette contains the Soldiers' and Sailors' Monument, costing $50,000.

Churches and Charities.—Buffalo is the seat of a Roman Catholic and an Episcopal bishop, and has two handsome cathedrals. Besides these there are 37 Catholic churches, 13 chapels and 12 convents; and 171 Protestant, besides 16 missions and chapels, the most numerous being the Methodist Episcopal (24 English, 3 German), Baptist (25 churches and 5 missions), Lutheran (13 German, 5 English, 3 Scandinavian), Presbyterian (18), Protestant Episcopal (16, with 11 missions), and German United Evangelical (15). There are also nine synagogues.

There are 12 children's refuges in Buffalo, and 9 homes and refuges for adults; besides a S. P. C. C. and S. P. C. A., and many religious associations for relieving distress; 18 hospitals, besides the United States Marine Hospital; the Erie County almshouse; lodging and supply stations for the temporary relief of the indigent; a city physician, a district nursing association, and diet kitchens; a German Y. M. A. and the Y. M. C. A.;

and a Women's Educational and Industrial Union. Of the children's institutions, the most notable is the free Fitch Institute for poor children, a combined orphanage, crèche—day nursery for children of poor working mothers—training school for nursemaids, etc.; all managed by the Charity Organization Society (organized 1877, the first in the United States), with its home in the building. Of the other institutions, special note may be made of the Buffalo Orphan Asylum, St. John's Orphan Home, the Home for the Friendless, St. Vincent's and St. Joseph's orphanages (Roman Catholic), St. Mary's Asylum for Widows and Foundlings and St. Mary's Institution for Deaf Mutes, the Church Home for Aged Women, and the Ingleside Home for Erring Women.

Miscellaneous.—Buffalo claims the distinction of being the cleanest and healthiest city in the United States, the death rate in 1900 being 14.8 and in 1901 12.25. The waterworks, built in 1888, are supplied from the lake; they cost $9,100,000, and are owned by the city; the reservoirs have a storage capacity of 200,000,000 gallons a day, the average consumption is about 100,000,000, and there are over 500 miles of mains; the service costs $650,000 a year. Electric lighting is almost universal in business houses and the finer residences, from the cheap power furnished by Niagara Falls. The municipal government consists of a mayor elected for four years; an alderman from each of the 25 wards, and nine councilmen at large; a city clerk appointed by the council, and health, fire, park, police, and civil-service boards appointed by the mayor; the remaining officials elected by the people. Pop. (1820) 2,095; (1830) 8,668; (1840) 18,213; (1850) 42,261; (1860) 81,129; (1870) 117,714; (1880) 155,134; (1890) 255,664; (1900) 352,387; (1910) 423,715.

BUFFALO, n. *bŭf'fă-lō* [Sp. *búfalo*, a buffalo: OF. *buffle*, the bugle or wild ox: Gr. *bou'balos*—from *bous*, an ox (see BUFF 1)], (*Bos Bubalus*): animal of the ox tribe. BUFFLE-HEADED, a. *bŭf'fl-hĕd'ĕd*, having a large head like a buffalo; dull; stupid. The buffalo is a native of the East Indies, where it has been long domesticated, whence it was carried to Egypt and to the s. of Europe. It was introduced into Italy about the close of the 6th c., and is now generally used as a beast of draught and of burden in that country, as also in India.

The B. is larger than the ox, and its limbs are stouter. Its form is more angular and clumsy; the head is larger in proportion to the size of the body; and the forehead is rather convex, and higher than broad; the dorsal line rises into a considerable elevation above the shoulders; the dewlap and the tail resemble those of the ox; the horns are large, slightly compressed, recline toward the neck, and have their points turned up. It is characteristic of the B., when walking or running, to carry the head with the muzzle projecting straight forward, and the horns laid back on the shoulders. The hair is irregular and bristly, often very thin, so that the smooth brown hide 'shines with an unpleasant polish in the sunlight.' In this, as in other respects, the animal is adapted for marshy situations, which it naturally affects; preferring for its food the rank, coarse herbage which they afford, delighting to immerse itself in water till only its head appears above the surface, in which condition it will remain for hours, and often enveloping itself in mud as a protection against insects. On account of these propensities, the buffaloes used as beasts of burden in India are seldom laden with any goods liable to be spoiled by water, as the animal is always ready to take an opportunity of lying down with his load in any river or pond which presents itself. In Italy, the B. seems nowhere more at home than in the Pontine Marshes and the pestilential Maremma. The regions where malaria is most prevalent seem most adapted to its constitution.

The B. is much more powerful than the ox, and capable of dragging or carrying a far heavier load. The female yields a much greater quantity of milk than a cow, and of excellent quality. It is from B. milk that the *ghee* or semi-fluid butter of India is made. The hide is greatly valued for its strength and durability, but the flesh is very inferior to that of the ox.

The B. exhibits considerable intelligence. In domestication, it is capable of becoming very docile. In the s. of Europe, it is generally managed by a ring passed through the cartilage of the nose, but in India by a mere rope. The Indian driver rides upon a B.; but these animals keep so closely together as they are driven along, that, if necessary, he walks from the back of one to that of another perfectly at his ease. In a wild state the B. is savage and dangerous, and even in domestication it is apt to resent injury. The native princes of India make buffaloes and tigers fight in their public shows, and the B. is more than a match for the

tiger, even in single combat. The appearance of a tiger excites a herd of buffaloes, much as we see oxen excited by the approach of a dog; and if his safety is not secured by flight they kill him, tossing him from one to another with their horns, and trampling him with their feet.

The B. is used in some parts of the east as an aid in the shooting of waterfowl, being trained to the sport, and sold at a considerable price. The sportsman conceals himself behind the B., which, being a familiar sight, is not alarming to the birds.

The CAPE B. (*Bos Caffer*) is generally regarded as a distinct species. It seems never to have been reduced to the service of man, although there is reason to believe it quite capable of domestication. The horns are very large; they spread horizontally over the top of the head, and are then bent down laterally, and turned upward at the point. The head is carried, as by the common B., with projecting muzzle and reclining horns, but the bases of the horns nearly meet on the forehead, where they are from eight to ten inches broad. The length of a full-grown Cape B. is about 8 ft. from the root of the horns to the tail, and the height 5½ ft. This is the most formidable animal in s. Africa; and the hunter will more readily risk an encounter with a lion than offer provocation to a B. without great advantages for the combat, or great facilities for escape. The B. is still found in large herds in the interior of s. Africa, but in Cape Colony, where it was formerly plentiful, it is now comparatively rare. The hide is so thick and tough that the Kafirs make shields of it, impenetrable to musket-shot; and the balls used by the huntsmen in shooting the animal are mixed with tin, and yet are often flattened by the resistance. The Cape B. grazes chiefly in the evening, and lies in woods and thickets during the day.

An attempt has been made to establish a genus, *Bubalus*, having the common B. for its type; but the characters lack precision, and the limits are uncertain.

The *Buffalo* of the Anglo-Americans is the American Bison: see BISON.

BUFFALO-BERRY: a plant, *Shepherdia argentea*.

BUFFALO-BUG, CARPET-BEETLE or CARPET-BUG: a dermestid beetle (*Anthrenus scrophulariæ*) whose larva is hairy along the sides. It is very destructive to carpets and woolen fabrics.

BUFFER, n. *bŭf'fĕr* [OF. *bufer* or *buffer*, to strike (see BUFF 2)]: apparatus at the ends of railway carriages, which when driven in, spring out again, and so prevent injury to the carriages when they come into contact; any cushion-like article to take away the force of a blow; a contemptuous epithet applied to a man or boy. BUFFER-HEAD, n. in *railway carriages*, the part of the buffer apparatus which receives the concussion. *Note.*—In the sense of a jovial companion, *buffer* is probably a corruption of F. *buffetier*-man, or *buffet*-man.

BUFFER, n. *bŭf'fĕr* [OF. *bufer*, to puff out the cheeks]. in *OE.*, a stammerer; a foolish fellow: see BUFFER 1.

BUFFET, n. *bŭf'fĕt* [OF. *bufe*, a blow, especially on the cheek: Ger. *puff*, a clap, a cuff (see BUFFER 1)]: a blow with the fist; a box; a slap: V. to strike with the fist or hand; to box or beat; to contend against. BUF'FETING, imp. BUF'FETED, pp. BUF'FETER, n. one who.

BUFFET, n. *bŭf'fĕt* [F. *buffet*, primarily, the tap of a tavern, then a sideboard]: a cupboard or set of shelves for crockery; a sideboard on which the drinkables are placed at meals. In France, a refreshment bar.

BUFF LEATHER: usually made out of salted and dried S. American light ox and cow hides. After being limed in the usual way, they are unhaired and rounded, so that only the best part of the hide is made into buff leather. The grain and flesh being then scraped or cut off, the true cuticle, which is of a flexible fibrous nature, alone remains. The hide is next sprinkled over with cod-oil, and placed in the *stocks*, where it is worked for about 15 minutes. Having been taken out and partially dried, it is again submitted to a similar process of oiling and stocking; and during the first day, these operations may be repeated six times, decreasing daily for about a week, when one oiling and stocking in a day is sufficient. The hides are then placed in a stove, and subjected to a process called 'heating off,' after which they are scoured and rendered free from oiliness by being soaked in a strong lye of carbonate of potash. They are next worked well in the stocks, hot water being poured copiously upon them until the water runs off pure. Having been dried, they are subjected to a process called *grounding*—i. e., they are rubbed with a round knife, and also with pumice stone and sand, until a smooth surface is produced. The leather, which is very pliant, and not liable to crack or rot, is now ready for the market. The natural color of the leather is light-yellow, but for some purposes it is bleached white. The precise chemical operation of the oil in the process of the manufacture is rather obscure, but as no glue can be got from the hide that has been made into buff, the gelatine of the hide must have entered into combination with some of the constituents of the oil, and had its nature completely changed.

BUFFON, *bŭf'un*, Fr. *bü-fōng'*, GEORGE LOUIS LECLERC, Comte de: 1707, Sep. 7—1788, Apr. 16; b. Montbard, Burgundy: famous naturalist and writer. He turned from the law which he had studied at the college of Jesuits at Dijon, and applied himself to astronomy and mathematics, and afterward to zoology. He travelled through France and Italy, and came to England, where he translated Newton's *Fluxions* and Hales's *Vegetable Statics*. In 1733, he wrote several original essays. His *general* love of science received a definite impulse toward zoology by his appointment, 1739, as intendant of the royal garden and museum. Hitherto zoology, consisting of a series of unconnected observations and fruitless attempts at classification, had been commonly regarded by educated readers as a dry study, and

by savans as play-work. B. first conceived the idea of making it attractive to the first of these classes, while securing for it the respect of the second. His plan was comprehensive enough, since he aimed at nothing less than a collection of all the separate known facts of physical investigation, and a systematic arrangement of these, to assist the author in forming a theory of nature; but B. had neither the science nor the patience for such a task. Endowed, however, with a brilliantly rhetorical imagination, and always inclined to deliver himself from doubts and ignorance by sparkling hypotheses, the elaboration of which cost him little trouble, he produced a work which, though not severely scientific in its method, shone with what was deemed the brightest literary lustre. And indeed many of his views are very ingenious, though later researches have shown them fallacious. The *Natural History* of B. made an epoch in the study of the natural sciences, though it has now little or no scientific value. His attempted explanations of natural phenomena were opposed by Condillac, who, with Helvetius, Diderot, D'Alembert, and others, ridiculed, with a certain degree of justice, the excessive pomp of B.'s style. The most insignificant part of B.'s treatise is the mineralogy, for which his knowledge was utterly inadequate. The systematic and anatomical arrangement of the mammalia was executed by his colleague Daubenton. B.'s works passed through numerous editions, and several were translated into most of the languages of Europe. The best complete edition is the *Histoire Naturelle Générale et Particulière*, 36 vols. (Par. 1749–88). After receiving several high honors, being elevated to the rank of Comte de B. by Louis XV., and treated with great distinction by Louis XVI,, B. died in Paris. In person and carriage B. was noble; as a Parisian academician, and a self-complacent, theoretical naturalist, dressed in courtly style, pursuing his pleasant studies in the *allées* of the royal garden, and largely participating in the vices of his time, B. was a model of a French philosopher of the 18th century.

His son, Henri Leclerc, Comte de B., b. 1764, was attached, at the outbreak of the Revolution, to the party of the Duke of Orleans, and fell under the guillotine.

BUFFOON, n. *bŭf-fōn'* [F. *bouffon;* Sp. *bufón*, a jester—from Sp. *bufa*, a scoffing: It. *buffa*, a trick; *buffare*, to puff, to blow hard: comp. L. *būfo;* Gael, *buaf*, a toad]: a droll who diverts a company with antic gestures; a man who amuses others by tricks, antic gestures, and jokes. In the corrupt Latinity of the middle age, *buffa* meant a slap on the cheek; and in the Italian, *buffare* signified the puffing of wind through the mouth. It is probably from the favorite trick played by clowns in farces—one swelling out his cheeks with wind, the other slapping them so as to make a ludicrous explosion—that the word is derived: V. to make ridiculous. BUFFOON'ING, imp. BUFFOON'ERY, n. *-ėr-ĭ*, the tricks of a buffoon; low jests; drolleries. BUFFOON'ISH, a. BUFFOON'ISM, n. *-ĭzm*. BUFFO, n. *bŭf'fō*, the comic actor in an opera. A burlesque opera is called *opera buffa*, a burlesque play *commedia buffa*.

In Italy, the *buffo cantante* is distinct from the *buffo comico;* the former having greater musical talent, and sustaining a more important part, the latter having greater license in jocoseness. The voice of a *buffo cantante* is generally a bass, but sometimes a tenor buffo is introduced.

BUFORD, *bū'ford,* JOHN, Major-General: 1826–63; b. Ky.; d. Washington. In 1848, he graduated at West Point, was brevetted, served in the expedition against the Sioux 1855, and in the civil commotions in Kansas 1856–7, etc. In 1862, he received the command of a brigade of cavalry, and led in many cavalry engagements —notably at Antietam, Fredericksburg, and Gettysburg.

BUFORD, NAPOLEON BONAPARTE, American soldier; b. Woodford County, Ky., 1807, Jan. 13; d. 1883, March 28. He was graduated at West Point, 1827, did garrison duty in Virginia and Maine as second lieutenant in the 3d Artillery, and was assistant professor of natural and experimental philosophy at the military academy, 1834–5, when he resigned his commission, became an engineer in the service of the State of Kentucky, 1835–42, and a merchant and iron founder at Rock Island, Ill., 1843–61, being president of the Rock Island & P. Ry., 1857–61. He entered the Civil War as colonel of the 27th Illinois Volunteers, took part in the battle of Belmont 1861, Nov. 7, the attack on Island No. 10 in the Mississippi River, 1862, March–April, captured Union City, Ky., 1862, March 31, took part in the expedition to Fort Pillow, the siege and battle of Corinth, and the siege of Vicksburg, 1863, February. On 1865, Aug. 24, he was mustered out of service with the rank of brevet-major-general of volunteers, conferred for gallant and meritorious services during the Rebellion. He was special commissioner of Indian affairs during 1868, and for inspecting the Union Pacific Railroad, 1867–9.

BUG, n. *bŭg* [W. *bwcai,* what produces dread or disgust: W. *bwg;* Gael. *bocan,* a goblin, an evil spirit: Alb. *boube;* Russ. *buka,* a bugbear]: a ghost or other frightful object; a name applied to various insects; an offensive insect common in dirty dwelling-houses. BUG'GY, a. *-gĭ,* full of bugs. BUG'GINESS, n.

BUG: name including a large family of offensive insects, *Cimicidæ,* of the order *Hemiptera* (q.v.), sub-order *Heteroptera,* and often further extended in its signification to include the whole of that sub-order, the insects of the section *Geocorisæ* being designated land-bugs, and those of the section *Hydrocorisæ,* water-bugs, the latter including water-scorpions, boat-flies, etc. In the United States the term B. is often improperly applied to almost all kinds of insects. All the insects of the sub-order above named, particularly the land-bugs, though some are radiant in beautiful colors, have strong resemblance in form and structure to the annoy-

ing and disgusting HOUSE BUG or BED BUG (*Cimex lectularius*). See PARASITES, EXTERNAL.

The Bed Bug is destitute of wings—an anomalous peculiarity, as the insects of its order, and even of the same family, are generally furnished with them. The body is very flat, of a somewhat oval form; the whole insect is of a dirty rust color, emits an offensive odor, and is about three-sixteenths of an in. in length; the legs are moderately long, and capable of being employed for somewhat rapid motion; the antennæ are thread-like and very slender, about half the length of the body; the mouth is formed for suction alone, and is furnished with a sort of proboscis, which is three-jointed, forms a sheath for the true sucker, and when not in use is recurved under the head and thorax. The Bug lurks during the day in crevices of walls, of bedsteads, and of other furniture, but is active during the night; and when it finds opportunity, sucks blood until it distends itself. It seems, however, to be capable of subsisting long without food. Young bugs resemble their parents in most things, except size and the want of *elytra*, insects of this order not undergoing such marvellous transformations as those of some other orders. The best preventive of bugs in a house is *scrupulous attention to cleanliness*. Where the nuisance exists, it is not easily removed, but one of the best and safest means is thorough washing with spirit of turpentine, though recourse is had to washing with a solution of the dangerous corrosive sublimate.—Other species of Bug (*Cimex*) suck the blood of some of the inferior vertebrate animals, as pigeons, swallows, bats, etc.; but the greater number of insects of the bug family live by sucking the juices of vegetables. A small species (*Tingis pyri*), which sucks the leaves of the pear-tree, is very destructive in some parts of Europe, where it is popularly called the *tiger*. Some of these winged wood-bugs or field-bugs are capable of inflicting very painful wounds. Flying-bugs, 'enormous and fetid,' are among the pests of India. Night is the time of their activity. Warm countries generally have winged bugs of great size and beauty; but if touched or irritated, they 'exhale an odor that, once perceived, is never after forgotten.' A winged bug, as large as a cock-chafer, lodges in the thatch, and roofling of houses in Chili, and sallies forth at night, like the Bed Bug, to suck blood, of which it takes as much as a common leach.—It is worthy of notice that a species of field-bug (*Acanthosoma grisea*), native of Britain, is one of the few insects that have been observed to show affection and attention to their young. DeGeer observed the female of this species, which inhabits the birch-tree, conducting a family of 30 or 40 young ones as a hen does her chickens, showing great uneasiness when they seemed to be threatened with danger, and waiting by them instead of trying to make her own escape.

BUG, or BOG, *bôg*, EASTERN (the *Hypanis* of the ancients): river in Russian Poland, rising in Pedolia, flows s. into the estuary of the Dnieper; length more than 400 m. It is navigable for small-craft as far as Wosnessensk. At the junction of the Ingul with the Bug, is the city of Nicolajew (q.v.).

BUG, or BOG, WESTERN: river in Russian Poland: largest tributary of the Vistula; rises in Austrian Galicia, and after a course of about 450 m., and receiving numerous tributaries, joins the Vistula at the fortress of Modlin, near Warsaw. It is navigable for a considerable distance.

BUGBEAR, n. *bŭg'bär* [*bug*, with *bear*, as an object of dread (see BUG)]: anything that scares or frightens, real or imaginary: V. to alarm or scare by any means. BUG'BEARING, imp. BUG'BEARED, pp. *-bärd*. BUGABOO, n. *bŭg'ă-bô* [*bug*, with the addition of W. *bw;* Gael. *bo*, an interjection to frighten children]: in *OE.*, a spectre.

BUGEAUD DE LA PICONNERIE, *bü-zhō' dėh lâ pē-kon-ré*, THOMAS ROBERT (Duc d'Isly, Marshal: 1784, Oct. 15—1849, June 9; b. Limoges, France. In his 20th year he entered the army as a private. His conspicuous bravery in the Prussian, Polish, and Spanish campaigns gained him rapid promotion. Shortly before the fall of Napoleon, Bugeaud was made a col., and in 1815 commanded the advance-guard of the army corps of the Alps. He afterward retired to his estate, but was called into public life by the July revolution of 1830. He was elected deputy for Perigueux, and gained the esteem of Louis Philippe, who created him a marshal. In 1835, he voted against electoral reforms and universal suffrage, denounced 'the tyranny of the press,' and made himself very unpopular. In December 1840, he was appointed gov. gen. of Algiers. He immediately set about organizing the celebrated irregular force known as the Zouaves, and in a few years the French arms were everywhere triumphant over the Arab tribes. The cruelty of some of Bugeaud's proceedings excited strong feelings of reprobation in France and in Europe generally. In 1844, he gained a victory over the Emperor of Morocco's forces at Isly, for which he was created Duc d'Isly. In the revolution of 1848, Feb., Marshal Bugeaud had command of the army in Paris, and would have dissuaded the king from signing the act of abdication; but panic made such counsel useless. Among all the friends of Louis Philippe, Bugeaud seems to have been the only man who preserved firmness and presence of mind. When Louis Napoleon became president, he intrusted to him the chief command of the army of the Alps. Bugeaud died of cholera, in Paris.

BUGENHAGEN, *bô'kn-hâ-kn*, JOHANN, surnamed *Pomeranus*, or Dr. Pommer: 1485–1558, Apr. 20.; b. Wollin, near Stettin, Pomerania; one of Luther's chief helpers in the Reformation. He studied at Greifswald,

and as early as 1503 became rector of the Treptow Acad., where he lived quietly, fulfilling the duties of his office till 1520, where his religious views were changed by reading Luther's little book, *De Captivitate Babylonicâ*. Bugenhagen was now seized by the zealous spirit of the Reformation, and, to avoid the persecutions of the Rom. Cath. party, he betook himself to Wittenberg, where his talents procured for him in succession several high positions. Bugenhagen's remarkable philological and exegetical powers were of great service to Luther in his translation of the Bible. In 1525 he opened the controversy between Luther and Zwingli by a treatise against the latter, to which Zwingli ably replied. He had a superior talent for organization, establishing churches in Brunswick, Hamburg, Lubeck, and Pomerania. In 1537, he was called to Denmark by Christian III. to reform the ecclesiastical establishments of that country. He accomplished this so admirably, that the Danes to this day consider him their Reformer. In 1542, he returned to Wittenberg, and continued his energetic efforts to extend the new theology throughout his native land. His best work is his *Interpretatio in Librum Psalmorum* (Nürnberg, 1523).

BUGGY, n. *bŭg'gĭ:* a light four-wheeled vehicle with or without a hood: when hooded it is called a top-buggy.

BUGHIS, or BUGIS, *bô'jhēz:* Malay tribe whose chief abode is in the s.w. peninsula of Celebes; but during the present century, numbers have emigrated and established communities in Borneo, Sumatra, Singapore, and other places. They cultivate the arts of peace; have domesticated the sheep, ox, horse, and buffalo; built substantial houses and sailing vessels; and have skilled mechanics, who work in copper, iron, cotton, etc. Some are engaged in various fisheries; while their merchants carry on most of the trade in the neighboring seas. They have reduced their language to writing; have a calendar similar to ours; use the compass and charts in navigation; and have embraced the Mohammedan religion. Their government is an oligarchy which can depose the emperor at any time by an adverse majority.

BUGLE, n. *bū'gl* [a dim. of M.H.G. *bouc* or *bouch*, a large ring, an armlet: AS. *beag*, an armlet: Icel. *baugr*, a spiral ring (see BUCKLE)]: in *O.E.*, a small ornament of a rounded shape; one of the fine glass tubes or beads, sewed on ladies' dresses by way of ornament.

BUGLE, n. *bū'gl* [F. *bugle*, a bugle—from L. *būc'ŭla*, a heifer: mid. L. *buc'ŭlus*, a wild ox: F. *buffle;* It. *buffalo*, a wild ox]: a hunting horn, formerly spelt *buffalo-horn;* a musical wind-instrument; (*Ajuga*): genus of plants of the nat. ord. *Labiatæ*, having an irregular corolla, with very short upper lip and trifid lower lip, the stamens protruding. The species are mostly natives of the colder parts of the old world.

The Common B. (*A. reptans*) is abundant in moist pastures and woods. Its flowers are generally blue, but varieties occur with white and purplish flowers, often introduced into flower-borders. The Alpine B. (*A. alpina*) is one of the beautiful flowers of the Swiss Alps. BUGLER, n. *bū'glĕr*, in *mil.*, the soldier who gives signals on a bugle.

BUGLOSS, n. *bū'glŏs* [L. *buglossa*—from Gr. *bous*, an ox; *glossa*, a tongue]: popular name of many plants, generally mucilaginous and emollient, of the nat. ord. *Borragineæ* (q.v.), as the species of *Anchusa* or Alkanet (q.v). etc. In some botanical works it is confined to the genus *Lycopsis*, a genus differing from *Anchusa* in little but the curiously-curved tube of the corolla. The beautiful genus *Echium* bears the English name of VIPER'S BUGLOSS.

BUHL, n. *būl* [after *Boule*, a French carver in wood]: unburnished gold, mother-of-pearl, etc., used for inlaying in dark wood, etc. BUHL-WORK, inlaying wood, etc., with metal or mother-of-pearl or other substances in ornamental patterns. Its inventor, Boule, an Italian cabinet-maker, settled in France in the reign of Louis XIV. He employed veneers of dark-colored tortoise-shell, inlaid with brass. Cabinets of his manufacture are highly prized, as are those of his contemporary Reisner, a German, who used a ground of tulip-wood, inlaid with flowers, etc., in darker woods, and varied with margins and bands of light wood, with the grain crossed for contrast. This modification of buhl-work is correctly called Reisner work. See INLAYING: MOSIAC.

BUHREACH', or BHARAICH, *bhâ-rāch':* town of Oude, India; principal place of the dist. of B.; n. lat. 27° 34′, e. long. 81° 33′; 65 m. n.e. of Lucknow. It is an old town, of considerable size, in a pleasant wooded plain, on the left bank of the Sarju. The houses are built mostly of mud and covered with thatch; but the mausoleums, mosques, and residences of merchants are of brick and lime-mortar. Northeast of the town is the tomb of Selar, a reputed Mussulman saint, to which there is a great concourse of pilgrims annually in the month of May. Pop. 24,046; of dist. 1,000,432.

BUHRSTONE, or BURRSTONE, n. *bėr'stōn* [Gael. *borr*, to protrude, to swell: F. *bourre*, a stuffing; prov. Sw. borre, a fir-cone: OE. *bur*, a whetstone for scythes]: a variety of quartz (q.v.), containing many small empty cells, which give it a peculiar roughness of surface, adapting it for millstones. The name is given without reference to geological relations, but it is *vein quartz*, rather than true *quartz rock*, which ordinarily assumes the character of buhrstone. There are different varieties of buhrstone, some of which are more compact, or have smaller cells than others; and those in which the cells are small and very regularly distributed, about equal in diameter to the spaces between them, the stone

being also as hard as rock-crystal, are most esteemed. Some of the best millstones are obtained from the quarries of La Ferté-sous-Jouarre, in the dept. of Seine-et-Marne, near Paris. A single millstone in one piece of 6 ft. diameter, sells for about $250, and one formed of several pieces for about $165. It is not unusual to form millstones of pieces of B. cut into parallelopipeds, like great wedges of soap, and bound together by iron hoops. The stone is found in beds or in detached masses, and the mode of quarrying is peculiar. When the mass is large, it is cut into the form of a huge cylinder; around this, grooves are cut, at distances of about 18 in., the intended thickness of the millstones; into these grooves, wooden wedges are driven, and water is thrown upon the wedges, which, causing the wood to swell, splits the cylinder into the slices required. Millstones are not always made of Buhrstone, but sometimes of silicious gritstones, of sandstone, and even of granite. Buhrstone millstones are extremely durable.

BUILD, v. *bĭld* [Ger. *bilden*, to form, to fashion: old Sw. *byli*, a habitation; *bylja*, to raise a habitation: Gael. *baile*, a town or village]: to form or fashion; to construct; to make or raise anything—as a wall, a house, or a ship; to shape into a particular form; to raise on a foundation; to increase; to depend on as a foundation. BUIL'DING, imp.: N. an edifice; a fixed structure —as a house, a church. BUILT, pt. pp. *bĭlt*, or BUILDED, pp. *bĭld'ĕd*. BUILDER, n. *bĭl'dẽr*, one who erects buildings.—SYN. of 'build': to construct; erect; fabricate; frame; raise; establish; settle; rest; depend.

BUILDING: the art of constructing, applied usually to erecting edifices for habitation, business, or other purposes. The building trade includes many distinct lines. At the head is the architect, employed by the owner to design the building and make the working drawings and specifications of the work to be performed. The builder acts ministerially; the duty consists in carrying out the plans put into his hands according to certain stipulated terms. The profession of an architect demands much imaginative power and great artistic skill, with a practical knowledge of construction even to its smallest details. Endeavoring to realize the wishes of his client, the architect devises what shall be the external effect and the interior accommodation of the building, and portrays the whole with accuracy on paper. After the general designs, giving an idea of the proposed structure, have been approved, the architect furnishes the working plans and specifications, in which are shown or described all the materials and modes of construction to be used in the building, and which are intended to guide all the mechanics, in their several operations. These services of the architect involve much thought and labor and he usually employs assistants, by whom the plans are elaborated from his sketches

and under his orders. The writing of the specifications is a matter of careful study, requiring acquaintance with the characteristics and qualities of all the materials involved in the structure, such as stone, lime, cement, sand, bricks, wood, iron, slate, etc., and their resistance to the strains to be imposed upon them. It is customary for the builder, or contractor, as he is often called, to sign a contract to erect the building according to the drawings, and specifications, for a stated sum, by a given date, and under the supervision of the architect. During the execution of the work—unless a different arrangement has been made—the architect visits the building to see that it is being constructed according to the drawings and specifications. The architect also furnishes further full-size and detail drawings of all moldings, etc., where requisite, as the work progresses. In large constructions where it is necessary to have an agent of the architect to look after the work all the time, a 'clerk of works' is appointed who is paid by the client and daily reports to the architect the progress of the work. Until the building is finished the architect is paramount. For the due execution of his plans he feels that his professional reputation is at stake; and as he is responsible, the owner, if he wishes any changes, should consult the architect and not the builder. Such is the etiquette of the profession. The payments to the contractor are made upon the certificate of the architect stating that a certain point in the construction, specified in the contract, has been reached. The customary charges for architectural services are five per cent. on the cost of construction, which are divided as follows: one per cent. for preliminary sketches, one and a half more for the working drawings and specifications, one for detail drawings, and one and a half for superintendence. The charges for designing furniture, interiors, etc., vary, ranging from ten per cent. up to as high, sometimes, as fifty per cent.

The builder, having signed the contract, generally sublets parts of it to different trades; for instance, the plastering, the outside and inside wood-work, the staircases, the bell-hanging, the heating, etc. There are some firms that furnish the entire wood-work of a house, including the frame and all outside wood-work, and the doors and windows and all inside wood-work; so that the builder has only to put them together.

In England, builders undertake work by 'contract,' or by 'schedule of prices.' If by contract, they engage to execute the whole works for a stipulated sum. If by schedule of prices, they agree to abide by the measurements of valuators appointed by the architects. These valuators go over the works when finished, and, taking an exact account of everything, compare it with the account rendered by the builder; the architect being the ultimate referee.

It is exceedingly important, for the sake of an amicable adjustment of accounts, that the builder adhere scrupulously to the letter of the specifications—i.e., the covenant under which he has become bound. He can justify no departure from the specifications, on the plea that something as good has been given or done, or that he was not checked at the time by the clerk of works. Being explicitly a person employed to do a certain piece of work, in a certain way, he is in no respect entitled to substitute his own notions for those of his employers.

The application of a comprehensive manufacturing system in the preparation of various parts of a building is observable particularly in certain establishments of great magnitude. The test is this—whether the builder conducts so large a trade as to warrant him in setting up a steam-engine of great power, and in providing highly wrought machines for cutting and otherwise treating wood, stone, etc. When this degree of magnitude is reached, the operations are conducted under great advantage. Thus the Crystal Palace, in Hyde Park, London, could never have been built at the stipulated cost, nor in the required space of time, but by the application of steam-power to work of machines which shaped and groved the *two hundred miles* of sash-bars.

As an art, building is of vast antiquity, and has assumed different forms. In ancient Egypt, Greece, and Italy, building in stone rose to a high state of perfection, and till the present day it may be said that the greatest progress in the art is made only where stone of a manageable kind is conveniently at command. See BUILDING STONE. Rome, Paris, Lyons (with very many Italian and French cities), Bordeaux, Brussels, Munich, Geneva, Vienna, Edinburgh, and Glasgow are specimens of what may be achieved in stone workable with the chisel; Aberdeen is built mainly of granite. On the other hand London, the greatest city within the bounds of civilization, is built of brick; so are Manchester and Liverpool; also Amsterdam, Rotterdam, and other towns in Holland; and in general it seems that wherever brick has to be resorted to, there the allied arts of architecture and building, as regards domestic accommodation and elegance of style, have less development. The great variety of very good building stones in this country gives opportunity for artistic color effect; but in the large cities great office-buildings, some of them 10 or more stories high, have been erected of brick with stone or terra-cotta trimmings. The remarkable physical development of the United States in the last 20 years has caused an improvement and expansion of the steel, cement, brick, and terra-cotta industries which have done more to facilitate a complete transformation within the cities proper than any other causes. For the large majority of new buildings the systems of construction hitherto in vogue have been used without great change, and prob-

ably will continue to be so used. We must therefore look for signs of structural development, rather to the constructions commonly designated slow-burning, steel-skeleton, and fireproof.

Slow-burning Construction.—In buildings requiring special provisions against the spread of fire, and where the artistic effect is not of prime importance, a frequent mode of construction is that known as 'slow-burning' or 'mill' construction. The system consists usually in building outside walls (generally of brick) of concentrated piers or buttresses, connected by a thin curtain wall; the girders, beams, and interior columns are made of large timbers, and the floors of plank of a suitable thickness. It is essential to avoid concealed hollow spaces, such as furring, where dirt would accumulate. The underlying theory of slow-burning construction is that whereas small timbers, such as the three-inch joists and studs, and the one-inch flooring of ordinary construction, readily burn through and are destroyed, large timbers, under the influence of severe heat, char but do not burn through readily, as the charred surface forms a non-conductor and protects the interior. If, however, for any reason they should burn to destruction, all connections are so made that the timbers can fall out of their places without disintegrating the masonry or columns on which they rest.

Beams are spaced every 8 or 10 ft. between centres, and should not be painted for several years after completion of the building, in order to avoid dry-rot. The ends of timbers in masonry bear on iron plates with anchors, or rest in cast-iron boxes, with air spaces in the sides, which permit a circulation of air, and reduce the risk of dry-rot. Floor planks are not less than three in. in thickness, and for spans of 12 ft. usually four in. The larger spans are less desirable than the smaller. These planks should not be over nine inches wide. They should be planed on both sides, and grooved on the edges, the grooves being filled with hard-wood splines.

Top floors are made of $1\frac{1}{4}$ in. boards of southern pine, maple, or other hard wood. It is desirable to lay top floors over a three-quarter-in. bed of mortar, or two thicknesses of heavy sheating paper.

Roofs are best when flat, and are constructed in the same way as the floors. They should be covered with tin, gravel, or duck. Where the roof is pitched, it should be covered with shingles or slate, laid over a three-quarter-in. bed of mortar.

Superposed columns are connected by iron caps, bases, and pintles, arranged to give a proper bearing for the girders.

Steel Skeleton Construction.—There are three elements which enter into the construction of the steel-skeleton building,—foundations, columns, and floors. Of these three elements the column is the most important: for

while foundations may settle, deranging the floor levels and causing the building to lean out of plumb; and while floors may bend or break without serious danger to any parts of the structure other than themselves,—columns, if they fall, may entail the collapse of the entire structure. For this reason, in the best work, columns are made of the softer, less brittle grades of steel, while floor beams are permitted of 'medium' steel, a harder and consequently more brittle grade.

Many sections of columns have been devised, each having its own particular advantages, but columns in which all the surfaces, except those between riveted plates, are accessible, are generally to be preferred. These columns usually consist of a single web or plate, with one or more flange plates connected to the web by riveted angles. Other sections have been devised, but the choice of any one form depends upon the stability of its section, the ease of procuring the parts of which it is composed, and the facility of connections. It is sometimes necessary to use the box column, but it is not to be recommended by reason of the inaccessibility of the interior surfaces.

Columns are usually made in two- or three-story lengths. The bearing parts are carefully ground normal to their axis, and the connections are made by riveted cover plates. The extraordinary weights which these columns are called upon to carry, demand on ordinary soils a very extended footing. If this were attempted by the old method of brick or stone piers, the foundations would have to be carried to such depths that the system would not be economical. The customary method is that known as the grillage-beam system, in which the column starts from an iron or steel shoe which bears upon steel beams extending on opposite sides of the shoe, and bearing in turn upon one or more layers of beams bolted together and completely imbedded in concrete; under all is a layer of concrete whose area depends upon the compressive resistance of the soil. In rare cases the foundation is of solid rock, and the area may then be reduced to a minimum.

A peculiar type of grillage foundations is required for columns on or near party lines, beyond which the foundations may not extend. A cantilever construction is then used, whereby the wall column foundation is united by beams to the nearest interior column foundation, so that the two act together and in a measure counterbalance each other. Where foundations occupy an interior corner of a property, and must be maintained inside two intersecting party lines, it is often necessary to combine four grillages in the same fashion. Where the soil is of a very compressible nature, as is frequently the case in many parts of Chicago, the entire area of the building may have to be covered by a distributing foundation of concrete and beams, forming a pan upon which the building floats. Where possible,

it is preferable to penetrate through soft soils to a firm bed. In the lower part of Manhattan Island bed-rock has been reached by pneumatic caissons. These caissons are made of steel plates riveted together. The excavation is made under or in the caisson under air pressure sufficient to hold back any water-bearing material which may underlie the foundations of adjoining buildings. After the caisson has been sunk to its proper depth it is filled with concrete or such other masonry as has been designed to form the foundation. Hydraulic caissons have also been used for the same purpose. Where excavations adjoin high buildings on sandy soil, and are carried to a greater depth than the grillages, as in the case of the work on the subway in lower Broadway, New York, an artificial freezing process is sometimes resorted to. A network of tiny pipes is inserted into the sand foundation, winding in and out among each other, so as to reach every part of the foundation soil. A cold salt solution is sent through the pipes, causing the sand foundation to freeze solid. This is a very expensive process and not to be employed unless other means fail.

The floors used in steel-skeleton construction may be of any of the ordinary fireproof types, but in designing the floors it is necessary to connect the columns by steel beams or girders, which act best for the stability of the building if arranged in continuous straight lines. The voids between the girders are spanned by beams, whose spacing is dependent upon the style of floor to be used, varying from 5 to 12 ft., the spaces between being filled by brick arches or porous terra-cotta tiles, or by concrete slabs. The amount of material in the beams must be exactly sufficient for the work—no more or less. This is essential, not only for economy, but also to reduce the dead loads on the joints, columns, and foundations. There are many varieties of each of these systems, nearly all requiring the use of steel ties, plates, or rods. For spans over 12 ft. the monolithic concrete floor reinforced by steel bars or metal lath has been used, but there is a great tendency to deflection.

The girders of the exterior walls, commonly known as spandrel girders, are used at or near the level of each floor, and should be connected to the columns by knee or angle braces.

While the exterior walls of the building are carried in part on the spandrel girders, it is customary to rivet additional angles or channels on the outer face of the columns for the support of the outer four or more in. of the wall.

All projecting parts of the exterior, such as belt courses, cornices, and balconies, must be supported by special framings. The ornamental finish of cornices having any great projection is often secured to the frame by iron hangers.

All parts of steel framework, except those buried in

concrete, such as grillage beams, should be painted with the greatest care, as their preservation depends almost entirely on the quality of paint used and the way in which it is applied. All surfaces should be first thoroughly cleaned of scale and rust. It has been found that concrete adheres to a clean steel surface, and is a sufficient protection.

Fireproofing.—While the steel-skeleton building is economical from the constructive standpoint, its usefulness and safety are greatly impaired if it is left unprotected against the ravages of fire. Many systems of fireproofing have been devised, all of which, however, consist in enclosing the parts with a non-combustible substance,—usually a clay product, or concrete or plaster,—applied in blocks or molded forms, set in mortar. For the outside of exterior columns and girders it is considered sufficient to lay the outer facing of the wall, if of brick or terra-cotta, directly against the metal. Granite, by reason of its friability under the combined action of heat and water, should be kept sufficiently far away from the structural parts to allow of the insertion of a layer of concrete. For all other parts of the skeleton the usual protections consist of two in. of porous terra-cotta block, plaster block, or cinder concrete. Columns and beams are sometimes enveloped with a sheet of wire cloth or expanded metal, and plastered.

None of these systems may be considered absolutely perfect, since they have all shown serious signs of deterioration under the continued action of a fierce fire, but it is a conceded fact that concrete, as a fire-resisting material, is unequaled.

In connection with fireproofing it is essential that interior partitions be built of non-combustible materials. Those most frequently employed are of the same nature as the fireproofing just described. Porous terra-cotta blocks and plaster blocks, three or four inches in thickness, dependent upon the height of the story in which they occur, have certain advantages by reason of the rapidity with which they can be set up, and the ease with which they can be removed where alterations are desired.

In many so-called fireproof buildings wood finishes are desired, which with the contents are a menace; but experience has shown that fire can usually be confined to the room in which it originates, and can be checked in a few minutes. Methods of fireproofing wood have been devised, and consist of injecting a fireproofing solution into the pores, either under pressure or by capillarity. Its use is not frequent, however, being largely limited to war-ships.

See BUILDING STONE; ACHITECTURE; BRICK; CEMENT; CONCRETE; FOUNDATION; FLOOR; ROOF; DOOR; WINDOW; MASONRY; STRENGTH OF MATERIALS; etc.

BUILDING AND LOAN ASSOCIATION.

BUILDING AND LOAN ASSOCIATION: joint-stock assoc. in which the members by periodical subscriptions assist one another in purchasing homesteads. But such associations are rather mutual loan and accumulating fund societies than building societies; for they have nothing to do with building: they simply accumulate the periodical contributions of their membership, loan the money so accumulated to the members, receiving interest for the use, and, when the organization has fulfilled its purpose, distribute the fund, with its increment, among the members *pro rata* of their contributions. Building societies had their rise in England at the end of the 18th c., the first organization of the kind having been formed at Birmingham 1795, and called a building club, the object being mutual assistance among the members toward procuring homes. The first assoc. of this kind in the United States was founded in Philadelphia 1831, admittedly on the English model; it was called the Oxford Provident Building Assoc. At least two-thirds of the dwelling-houses of Philadelphia are owned by their occupants—mainly the result of the facilities afforded by the numerous building societies founded there. Other cities and suburban and manufacturing villages tardily began to follow this example, and such societies now exist in all sections of the United States, and their number is increasing rapidly.

A B. and L. A. is organized on the basis of a capital stock divided into equal shares, each share representing a par value usually of $200 or $250. A person becomes a member by subscribing for 1 or 2 shares as a minimum, or for 30 or 40 shares as a maximum, and paying an initiation fee—usually $1—and the first weekly or (calendar) monthly contribution to the fund—usually at the rate of $1 a month per share. When these periodical contributions, increased by the profits from interest on loans, premiums for loans, fines, and other sources of gain, have grown to be equal to $200 or $250 for each share, the object of the B. and L. A. is accomplished. If a member has borrowed from the society a sum equal to the face value of his share or shares (and he cannot have borrowed more), his debt is cancelled; if he has borrowed less, he receives the difference in cash; if he has simply been a contributor, he receives in cash for each share held by him the $200 or $250 represented thereby. The stock of an assoc. whose shares are $200, payable in instalments of $1 each calendar month, or whose shares are $250, payable in weekly instalments of 25 cents, may be expected to reach par in 10 yrs. The reason of this rapid attainment of par value by the stock is found in the principles on which these associations are conducted. Members may be borrowers or only investors, or partly one, partly the other. If a member does not borrow, he has only to pay regularly his periodical instalments on his shares; there are no extras, no incidental expenses; but a small fine is imposed in case of delay in making the periodical payments. Besides

these payments, a borrower has to pay a premium or bonus, in order to have the loan awarded to him. At stated intervals, say every 2 months, or whenever a given sum (say $3,000) is accumulated, a sale of loans by auction is held, at which loans in sums equal to the par value of the shares are awarded to the members who offer the highest premium. That premium may assume different forms, as will be seen, and it may differ between one sale or allotment and another. The borrower gives security for the continued payment of his instalments on his shares, of the interest on the loan, and of the instalments on the premium, if the premium was not paid at the granting of the loan. All these moneys, going into the common treasury, swell the fund and hasten the day of solvency. When that time comes—i.e., when the shares have become worth their face value—the debt of the borrowing member to the soc. is cancelled.

The premium is sometimes deducted from the loan—e.g., a loan of $250 is bought at a premium of $50; the borrower in that case gets $200. By the constitution of some societies, he pays interest on $250; in other societies, interest is paid on only the net amount of loan. Some societies permit the premium to be paid in weekly or 4-weekly instalments. Different from this is the system of 'interest in advance,' under which the would-be borrower offers to pay so many months' interest (above a fixed minimum) in advance for the privilege of a loan. In this case the amount of the interest is deducted from the amount of the loan, and the borrower has to pay only his instalments on his shares, till the months have passed for which he paid interest. Thenceforth he has to pay the regular rate of interest till the society has reached the goal of solvency. If a member wishes to draw out of the society before the end, he takes his actual contributions plus a low rate of interest, as determined by law or by the constitution and by-laws of the association.

A member withdrawing from a B. and L. A. is usually entitled to receive, in addition to the amount of his weekly or monthly contributions, interest on the same at a rate fixed by the regulations of the society, and under certain conditions a fixed proportion of the dividends declared on his shares. When a member withdraws within the first year of the existence of the association or of the 'series' to which his shares belong, usually he receives no interest. The member who withdraws at a later period is usually entitled to a share in the declared dividends, proportioned to the length of time over which his contributions have extended. Thus, after the 4th year he may receive 40 per cent., and for each year thereafter an additional 10 per cent. of the profits. And as soon as the profits and subscriptions on the shares in a series amount to the face value of the stock, the shares immediately become due, and are payable to the holders in the order of their original taking of stock.

In the practical working of these societies it was early found that, as the term of their existence approached, difficulty was experienced in placing money at loan. But few borrowers desire loans for short periods, and though the premium grew less as the stock approached par, that advantage was more than offset by the fact that all loans were peremptorily payable at the expiration of the association's term. Further, no new members joined, for the shares having greatly increased in value, their purchase became more difficult; the new member was obliged to pay a considerable sum to put himself on an equality with those who had belonged to the association for years. To remove these difficulties and make membership easily attainable to all, the plan of 'series' was adopted, and is now in almost universal use. Under this plan, the stock is issued in series, each having its own term for maturing, and each in effect being a new association. A new series may be started either at fixed times, as semi-annually, annually, etc., or whenever occasion may require. The funds from all the series are deposited in the general treasury of the society, and the accumulations from the contributions of all the members are open on equal terms to all. Accounts are kept with all the series, and the profits adjusted among them. When series 1 has reached the goal of solvency, series 2, 3, 4, etc., continue their business without any change.

The officers of a B. and L. A. are usually a pres., vice-pres., sec., treas., auditors, trustees, and an attorney. The sec. is the only salaried officer; the attorney is paid by fees, and his services are usually chargeable to borrowing members. No remuneration is due to the other officers as such. The funds of a B. and L. A., if it is, as most such societies are, a purely local assoc., are adequately safeguarded by the law in most states, and by the regulations and usage of the assoc. itself. All money must be deposited in bank immediately, and usually cannot be withdrawn without an order signed by the pres. The treas. is usually required at each regular meeting (weekly or monthly) to exhibit the bank-book to the board of management. No large sum of money can remain long in bank, for the fund must be put out at loan at fixed short intervals, or whenever a given sum is on hand.

There are now many thousands of these associations in the United States, with a membership of about 1,600,000 and assets of more than $600,000,000.

BUILDING LEASE: in the law of England, a demise of land for a long term of years, the lessee covenanting to erect certain houses or edifices thereon, according to specification. The usual term is 99 years, variable, however, according to circumstances. Special enactments control the making of such leases.

In the United States, building leases are not very common except in a few localities, and in the absence of any statutory regulations, the duration and conditions take the form of a private agreement, which may be made legally binding by having the subscribed documents recorded, between the parties interested.

BUILD'ING SOCI'ETIES: see BENEFIT SOCIETIES.

BUILD'ING STONE: stone used in construction: the chemical composition varies. The majority of kinds are more or less silicious, and are designated sandstones. These consist of particles of sand, united together by cohesion, and by a small proportion of a natural cement; in some cases, ferruginous, consisting of a compound of iron; and in other instances, calcareous, composed of carbonate of lime. Igneous rocks furnish very durable B. S., though in general the hardness of the materials renders them so difficult to work that they are seldom resorted to where softer stones can be procured. Thus, granite is largely used in bridges, in the paving of streets, and wherever great durability is required. Greenstone and basalt also are occasionally used. The B. S. in the new houses of parliament, London, is a magnesian limestone, or a double carbonate of lime and magnesia, very close and compact in texture, and soft enough to be easily cut with the chisel; unhappily it has not proved firm enough to resist weathering, having already shown signs of decay. The other forms of carbonate of lime exhibit considerable durability. Near Bath, and in the Isle of Portland, an oolitic limestone is quarried, which is easily cut, and stands well.

A convenient and accurate way of determining the durability of a B. S.—in other words, its resistance to frost and other atmospheric agencies—is to place a small block in a cold saturated solution of sulphate of soda; raise to the boiling-point, so as to expel air from cavities in the stone, which then become filled with the solution; then allow to cool, and suspend the block of B. S. in air. Every now and then, it is dipped into the solution, and subsequently air-dried. The result is, that the sulphate of soda crystallizes on the outside, and partially in the interior of the block, and in this respect acts as water does when it is frozen during winter; and if the B. S. be porous, and liable to decay by natural agencies, it gradually breaks up, and particles scale off. The amount of this corrosion can be determined by weighing the detached portions. Some building stones contain iron pyrites in little nodules diffused here and there throughout the mass, and such become discolored from the pyrites being decomposed by atmospheric influence, and the brownish-red oxide of iron (rust)

is left as a stain on the surface of the block. The liability to decay or to discoloration in a B. S. may be arrested to a great extent by coating the outer surface with boiled linseed-oil, which communicates a dark appearance to the stone, but prevents oxygen or moisture from gaining access to the block. Ordinary oil-paint is employed for the same purpose.

The most noted kinds of B. S. in the United States, in the order of their respective degrees of strength, are trap, granite, marble, limestone, and sandstone. Of these, the trap of Staten Island, N. Y., has a resistance to crushing force of 22,250 lbs. per cubic inch, and that of Jersey City Heights, N. J., 20,750. The granite of Richmond, Va., has a resistance of 21,250 lbs.; of Port Deposit, Md., 19,750; and of Quincy, Mass., and Westerly, R. I., of 17,750 each. In the marbles, that of Lee, Mass., is the strongest, showing a resisting power of 13,444 lbs., while that of Tuckahoe, N. Y., shows 12,950, and of Pittsford, Vt., 12,239. In limestones, the quarry at Kingston, N. Y., is the most remarkable, producing a stone with a resisting strength of 13,900 lbs. Glens Falls, N. Y., 11,475; Marblehead, O., 11,250; Joliet, Ill., 11,250; and Canton, Mo., 8,450, follow. Sandstone veins of working value are more numerous than any of the above. Official tests give the stone of Medina, N. Y., the greatest strength, 17,250 lbs. The noted quarry at Belleville, N. J., is second with 10,250. Little Falls, N. Y., is credited with 9,850 lbs; Massillon, O., 9,150; Vermilion, O., 8,450; Berea, O., 8,300; and Middletown, Conn., 6,950. The best known trap, the hardest and strongest B. S. in the United States, is cut at Bergen Hill, Jersey City Heights, N. J.; but its extreme hardness limits its use to foundations and those superstructures in which irregular shapes and sizes of blocks are desired. Small pieces are cut for paving stones, and the chips are utilized in ballasting the Pennsylvania railroad tracks between Jersey City and Philadelphia. Granite, the most appreciated stone for massive building purposes, is indigenous to the New England states, notably Maine, Massachusetts, and Rhode Island, and to the Alleghany, Rocky Mountain, and Sierra Nevada regions. The feldspar of granite runs from white through gray to red in color, the quartz has a smoky tinge, the hornblende is a greenish black, and the mica varies from white to a dull brown and black. These different shadings add materially to the popularity of granite, giving it a property of high architectural value for purposes of ornamentation. The quarry at Concord, N. H., yields a light gray, that at Quincy, Mass., a deep gray; while the Rocky Mountain quarries give an excellent quality of both gray and red. Marble is pre-eminent as the most beautiful B. S. the world over; but its liability to deteriorate from causes before mentioned, as well as from the effects of a strong saline atmosphere, has of late years caused it to be used more for interior than exterior work, especially in places near salt water. For the superstructure of church and public buildings it is being rapidly

superseded by granite. The best marble for building, ornamenting, and mural purposes is found in Rutland county, Vt., and the greater part so far quarried has been at West Rutland, Sutherland Falls, and Pittsford. Of colored marbles, black is taken out at Shoreham, Vt.; mottled gray at Plymouth, Mass.; mottled blue at Rutland, Vt.; mottled red, brown, and white near Burlington; and mottled chocolate, in Tennessee. Limestones vary greatly in texture, color, and ease of manipulation. That of Lockport, N. Y., is dressed without difficulty and gradually assumes the appearance of light gray granite; and that found in Kansas near Topeka also is readily cut, but hardens with exposure. The chief kinds of limestone now in use are those quarried at Dayton, O., light brown in color; Athens, Ill., dove color; Lockport, N. Y., gray; Glens Falls, N. Y., black; and at Sandusky, O., Louisville and Bowling Green, Ky. Sandstones are in more general use in the United States than any other B. S. They are classified as the Dorchester, Ohio, Waverley, Lake Superior, St. Genevieve, Medina, Serpentine, and brown stones. These also vary in color, bearing olive green, light drab, dove, purplish brown, straw, white, gray, grayish green, and dark red shades. Of these classes the brownstone is the most popular, and the leading quarries are at Portland, Conn., Belleville and Newark, N. J. The Ohio stone is chiefly found at Amherst and Berea; the Waverley in southern Ohio; the Lake Superior at Bass Island and Marquette, Mich.; the St. Genevieve in Missouri, the Medina in western New York; the Serpentine in the California ranges, and in some portions of Pennsylvania; and the Dorchester in the province of New Brunswick.

Within quite a recent period artificial stones have come into more or less general use for building purposes, owing to the increasing prices and scarcity of timber. Hydraulic cement is the basis of the various compositions, and among the best known varieties are the Béton Coignet, a French product, composed of Portland cement, silicious hydraulic cement, and clean sharp sand. When mixed with a small amount of cold water these constituents form a plastic compound which is hardened in molds to the consistency of stone; the Ransome stone, which consists of a mixture of sand and silicate of soda, molded into blocks and slabs, and hardened under pressure in a hot solution of chloride of calciul; Portland stone, consisting of a mixture of Portland cement and sand, or sand and gravel, rammed while plastic into molds to harden. The Portland stone, under various trade names, is used mainly in the United States. Consult Hall, *Treatise on the Building and Ornamental Stones of Great Britain* (London, 1872); Johnson, *The Materials of Construction* (New York, 1899); Merrill, *Stones for Building and Decoration* (New York, 1891).

BUITENZORG, *boy'ten-zork:* town of Java, provincial cap.; 36 m. s. of Batavia, with which it is connected by railroad. Its climate is mild and salubrious, and its botanical garden, laid out 1817, is one of the finest in the world. It has also many fine residences, a prison, a splendid palace, a garrison church, and mosques. In its neighborhood are a sacred grove, and the ruins of Padjajarara, formerly an important city and cap. of Java.

BUK'KUM WOOD: see BRAZIL WOOD: SAPPAN WOOD.

BUKKUR, *bŭk'kŭr:* fortified island of the Indus, in Sinde; lat. 27° 39′ n., long. 68° 56′ e.; 400 yards from Roree on the left bank, and 100 from Sukkur on the right. In the ordinary state of low water, the w. and e. arms of the river are respectively 15 ft. and 30 ft. deep. In particularly dry seasons, however, the former has been known to disappear altogether, and even the latter is said to have occasionally been fordable. B. is no longer of any military value against a civilized assailant, commanded, as it is, on both sides by higher grounds. It is composed of limestone, being 800 yards long, and 300 broad, and rising 30 ft. from the average level of the stream.

BUKOWINA, *bô-kō-vē'nâ:* duchy in the Cis-Leithan (non-Hungarian) section of the Austrian empire, on the Russian frontier; 4,035 sq. m. It is traversed by offsets of the Carpathians, gives rise to many rivers, and abounds in wood, with considerable mineral riches. Wood-cutting and mining afford occupation for a great number of the inhabitants. Large numbers of cattle are reared, and excellent horses. B., till the end of the 15th c., belonged to Transylvania, when it came under the dominion of the Turks, by whom it was ceded to Austria 1777. Czernowitz is the chief town. Pop. of B.—42 per cent. Ruthenian Slavs, and 33 per cent. Moldavians—(1900) 730,195.

BULACAN: town, isl. of Luzon, P. I., on Pampanga delta at the head of one of the main outlets of the Grande de Pampanga R.; 15 m. n. w. of Manila. It was formerly cap. of Bulacan Prov.; has important inland trade by river; and is in direct communication with Manila B. The most important indus. is sugar boiling. In 1859, with the exception of a few stone houses and a church, B. was destroyed by fire. It now has a town hall, church, about 2,000 stone houses and a number of factories in which silk matting is made. In 1900 it was made a military post by the U. S. authorities. Pop. 13,186.

BULB, n. *bŭlb* [F. *bulbe*—from L. *bulbus*, a globular root, an onion: Gr. *bolbos*]: the swelled-out or globular portion of a thing; an underground bud or stem consisting of scales or layers, as the onion —or solid, as the crocus—a solid bulb, however, being properly called a *corm;* the globular base of

the tube containing the mercury of a thermometer, etc. BULBED, a. *bŭlbd*, round-headed. BULBIFEROUS, a. *bŭl-bĭf'-ĕr-ŭs* [L. *fero*, I bear]: producing bulbs. BULBOUS, a. *bŭl'-bŭs*, globular; containing bulbs. BULBIL, n. *bŭl'bĭl*, or BULBLET, n. *bŭlb'lĕt*, in *bot.*, separable buds in the axil of leaves, as in some lilies. BULBOUS-BASED, in *bot.*, applied to hairs which are tumid at the base.

BULB, in Botany: a subterranean bud covered with imbricated scales, having at their base a flattened disc, which represents the proper stem of the plant, and from which the roots proceed downward, while from the midst of the scales an annual herbaceous stem and leaves are sent up. The scales are regarded as modified leaves, and sometimes all are fleshy, as in the lily; sometimes the outer ones are membranous, as in the onion, in which case the B. is said to be *tunicated*. The B. is popularly but erroneously regarded as the root or part of the root of the plant, and plants in which it is found are very generally described as *bulbous-rooted*. New buds are formed in the axils of its scales, which grow at the expense of the parent B., and gradually destroy it. In some plants, as the tiger-lily and some species of allium, leaf-buds (*bulbils* or *bulblets*) are developed on the stem above ground, which spontaneously separate and serve for the propagation of the plant, and which are entirely of the nature of bulbs, being formed of thickened scales, sometimes so closely united as to form a solid mass. The CORM (q.v.) was formerly regarded as a kind of B., and described as a solid B , but its structure is essentially different, although both it and the TUBER (q.v.) may be included in the description which Linnæus has given of the B. with reference to the purpose which it serves as 'the winter-quarters of the plant.' Many bulbs, if removed from the ground during the period when the vegetation of the plant is most dormant, may be kept in a dry place without injury for a considerable time, even for years. Bulbs serve also for the preservation of plants in periods of drought, and are particularly frequent in those which delight in sandy soils. The abundance of 'bulbous-rooted' plants is a remarkable characteristic of the flora of the Cape of Good Hope. 'Bulbous-rooted' plants are very often distinguished by the beauty of their flowers, and many of them are among the most esteemed ornaments of gardens and green-houses. The bulbs of tulips, hyacinths, and other favorite flowers are important articles of trade. Some bulbs, as that of the onion, are articles of food; others, as that of the squill, have medicinal properties.

BULBUL, n. *bûl'bûl:* Turkish name (used also in Persian) for the nightingale, which has found its way into English poetry through Byron's patronage. But the same name is given in India to a very different bird, *Pycnonotus hæmorrhous*, belonging to the great tribe of *Dentirostres*, and formerly ranked among the thrushes, to which it is nearly allied. It is a little bird of brilliant plumage, and the male has a crest or tuft on its head. It is remarkable for its

pugnacity; the Singhalese consider it the most *game* of all birds.

BULGARIA, *bûl-gā'rĭ-a:* autonomous principality, tributary to Turkey, which till 1878 constituted the Turkish vilayet of the Danube (Tuna). Bulgaria is bounded n. by the Danube and the Dobrudscha, now Rumanian; e. by the Black Sea; s. by the Balkan range; and w. by Servia and Roumelia. There are altogether between five and seven millions of the Bulgarian race; of the 3,744,283 who formed, 1900, the pop. of the principality, 78 per cent. were Bulgarians. Area, 38,080 sq. m. The country slopes terrace-like from s. to n., and from w. to the e. The soil in some parts is very fertile. The inhabitants belong to the Greek Church. The prince, freely elected by the people, must be confirmed by the Porte with the assent of the Powers. The first choice of the Bulgarians was the Prince of Battenberg, a cousin of the Grand Duke of Hesse, who in 1879 became Alexander I. of Bulgaria. The prince, originally regarded as too Russian in his sympathies, soon became the centre of Bulgarian national aspirations; and when, in the winter campaign of 1885–6, he completely defeated the Servians, who had invaded Bulgaria, he became the darling of the people. At the same time he fell more and more into disfavor with Russia and the Czar. In the summer of 1886 he was kidnapped by Russian partisans and carried into Russia. Returning immediately, he received an enthusiastic reception; but owing to the hostility of Russia, felt himself compelled to abdicate. A provisional government was formed, and firmly maintained the national cause in defiance of very strong Russian pressure.

The earliest known inhabitants of Bulgaria were the Mœsians who contended long against the Romans, and allied themselves with Gothic and Slavonic tribes against the Greek empire. Anastasius, the Greek emperor, 507, built an extensive wall to defend his territories from Mœsian invaders. In the 7th c., the Bulgarians, of Finnish origin, whose original seat was the banks of the Volga, conquered the Mœsians, and established the kingdom of Bulgaria; they soon lost their own language and customs, and became assimilated to the other Slavonic inhabitants. After being tributary to the Greek emperors, and contending for some time against Hungary, Bulgaria became subject to the Porte, 1392; but the frightful oppression of despotic and sanguinary pashas has not, even to the present day, robbed the inhabitants of a distinctively national life and love of freedom. In 1876, Apr., an insurrection broke out prematurely in B., and was quenched in blood, the Bashi-bazouks or Turkish irregulars committing savage excesses. The atrocities in Bulgaria, taken in connection with the Servian war and the condition of other Christian provinces of Turkey, led to diplomatic intervention;

and in Dec. a conference met at Constantinople, but without result. The war of 1877–8, between Russia and Turkey followed. The Congress of Berlin, which revised the treaty of San Stefano, declined to sanction the erection of a Bulgarian principality extending from the Danube to the Ægean. It made Bulgaria n. of the Balkans an autonomous principality, tributary to Turkey, and to the mainly Bulgarian province s. of the Balkans, that of Eastern ROUMELIA (q.v.), it granted administrative autonomy. In the autumn of 1885, the outbreak of a revolution in Eastern Roumelia, and Prince Alexander's acceptance of its union to Bulgaria, provoked the jealousy of Servia; and on Nov. 14, King Milan invaded Bulgaria, anticipating an easy march to Sophia. In the fourteen days' war which ensued, the Bulgarians suffered temporary defeat, till by his gallantry and generalship at Slivnitza, Prince Alexander turned the tide of battle, and, driving the Servians back through the Dragoman Pass, entered Servian territory at the head of 50,000 men, and captured Pirot. In 1886, March, a 'peace without friendship' was concluded between Servia and Bulgaria, and Prince Alexander was appointed gov.gen. of eastern Roumelia. See V. Baker's *War in Bulgaria* (1879); and Minchin's *Bulgaria since the War* (1880).

From the abdication (1886, Sep. 7) of Alexander I., who had been kidnapped but had soon returned, the country was governed by a regency till the summer of 1887. While the names of many princes and others were suggested as proper persons to invest with the crown of Bulgaria, Prince Ferdinand Maximilian Charles Leopold Marie, youngest son of the late Prince Augustus of Saxe-Coburg, was finally elected prince by the Sobranje. He married 1893, Apr. 20, Marie Louise, eldest daughter of Duke Robert of Parma. Two sons have been the issue of this marriage: Boris, 1894, Jan. 30; Cyril, 1895, Nov. 17. Russia and the Porte long refused to confirm the election of Prince Ferdinand; but in 1896 he consented to have his son Boris baptized into the Orthodox Greek Church. The czar of Russia acted as sponsor, being represented in proxy at the ceremony, Feb. 14. In the same month the election of the prince was formally confirmed by the Great Powers.

Prince Ferdinand I. was born 1861, Feb. 26. He chose for his cabinet: pres. of the council and minister of the interior, Mestamvuloff; foreign minister, Dr. Stransky; war minister, Lieut. Col. Woutkouroff; finance minister, M. G. D. Natchovitch; minister of justice, Dr. C. Stoyoloff; minister of education, M. Zivkoff. The cap. of Bulgaria proper is Sofia. Pop. (1900) 67,920; cap. of South Bulgaria (or Eastern Roumelia), Philippopolis, pop. 42,849, Eastern Roumelia effected a junction with Bulgaria by a bloodless revolution 1885, Sept. The Bulgarian army, when on a peace footing, consists of 39,000 men and officers; on a war footing it numbers 175,000

with 324 guns. In Eastern Roumelia there is also an efficient militia. The number of miles of railroad open in Bulgaria, 1901, was 1,020.

BULGE, n. *bŭlj* [Gael. *bolg;* W. *bwlg,* a swell or blister: Gael. *bulg,* a ship's bilge or convexity: Icel. *bolga,* a tumor (see BELLY)]: the broadest part of a cask; a protuberance; a swelling out: V. to swell out; to bilge as a ship; to take in water in large quantity, as a ship that has sprung a leak; to founder. BUL'GING, imp. BULGED, pp. *bŭljd. Note.*—In the sense of 'to take in water,' 'to leak,' *bulge* is merely another spelling of *bilge,* which see.

BULIMIA, n. *bū-lĭm'ĭ-ă,* or BULIMY, n. *bū'lĭ-mĭ* [Gr. *bous,* an ox, used as a prefix to augment the meaning of words; *limos,* hunger]: excessive appetite for food.

BULK, n. *bŭlk* [Bav. *bülken,* the body: Icel. *bulki,* a heap: Dan. *bulk;* prov. Sw. *bullka,* a projection, a protuberance: Gael. *balc,* a projection, a ridge of earth between two furrows]: the main mass or body; size; magnitude; the whole cargo of a ship in the hold: V. to stuff or swell out; to swell out or become prominent. BULK'ING, imp. BULKED, pp. *bŭlkt.* TO BREAK BULK, to begin to unload a ship; to break open a package of goods. IN BULK, in the mass; cargo loose in the hold of a ship and not inclosed in boxes or packages. BULKY, a. *bŭl'kĭ,* large; of great size. BUL'KINESS, n. *-nĕs,* greatness in bulk or size. BULKER, n. *bŭl'ker,* a person whose duty it is to find the capacity of a ship or goods, in order to ascertain and fix the freight or shore dues.

BULK, n. *bŭlk* [Icel. *bálkr,* a beam, a partition: It. *balco,* a projection before a window: prov. Dan. *bulke,* a boarded partition in a barn]: a framework of balks or boards; a partition of boards; the stall before a shop for the display of goods. BULK'HEAD, n. *-hĕd,* a partition across the hold of a ship, whether to separate it into rooms, or as a safeguard in case of wreck. *Water-tight bulkheads* are among the improvements in modern ship-building; they are iron walls running athwart the hold, as a means of dividing it into several portions; the interior is thus cut off into cells, each water-tight in reference to its neighbors. When such a shop is leaking in any one of the compartments, there is thus a chance that the others may be kept dry until the damage is repaired. In iron steamships the water-tight bulkheads are usually transverse, but there are frequently longitudinal water-tight divisions also. It is now common to place the engines and boilers in water-tight sections, and experience has proved the special value of a collision bulkhead in the bow. In iron-clads of the British navy, such as the *Hercules* and the *Bellerophon,* which have an inner bottom, there are nine transverse water-tight bulkheads. In the British torpedo-ram *Polyhemus,* the principle of having numerous

water-tight compartments in the lower part of the vessel has been carried as far as possible.

BULKELEY, *bŭlk'lĭ*, MORGAN GARDNER, American politician: b. East Haddam, Conn., 1837, Dec. 26. At the age of 15 he entered a mercantile house in Brooklyn, N. Y., and in a few years became a partner in it. When the Civil War broke out he went to the front as a private in the 13th New York regiment, and served during the McClellan-Peninsula campaign under Gen Mansfield at Suffolk, Va. In 1872, he came to Hartford, organized and became president of the United States Bank in that city, and later was elected president of the Aetna Life Insurance Company, a position he still holds. For 30 years he has been a prominent figure in local and state politics. He was four times elected mayor of Hartford, 1880–8, and in 1889 was elected governor. At the State election in November, 1890, the first gubernatorial election under the new secret ballot law, the Democratic ticket received a considerable plurality over the Republican ticket; but a majority being necessary to elect, there was some doubt whether there had been a choice by the people for governor or treasurer. Accordingly the matter went before the General Assembly, which met in 1891, January, and in which the Republicans had a majority of four on joint ballot, the Senate being Democratic. A long contest ensued between the two Houses, the Senate claiming the election of the recent Democratic candidates, and refusing to recognize in any manner Governor Bulkeley and the other hold-over Republican officials. The matter was finally settled 1892, Jan. 5, when the State supreme court, in the *quo warranto* suit brought against Governor Bulkeley by the Democratic candidate for governor, found 'Morgan G. Bulkeley to be governor, both *de facto* and *de jure*,' and his right to hold over till both houses of the General Assembly should unite in declaring the election of his successor was affirmed. As the two houses could not agree the governor remained in office for another full term. In 1892, November, the Democratic ticket swept the State. Governor Bulkeley later, as chairman of the Connecticut highway and bridge commission, interested himself earnestly in trying to procure a fine stone bridge across the Connecticut at Hartford. He was elected to the U. S. Senate for the term 1905–11.

BULKLEY, *bulk'lĭ*, PETER: 1583–1659; b. Odell, Bedfordshire, Eng.: the first minister, and one of the founders of Concord, Mass., emigrating, 1635. After studying at Cambridge Univ. he succeeded his father in the ministry at Woodhull, England, and after 21 years was removed for non-conformity. He had scholarly attainments, and was the author of some Latin poems, an elegy on the Rev. Thomas Hooker, and the *Gospel Covenant, or the Covenant of Grace Opened* (1646).

BULL, n. *bûl* [W. *bwla*; Icel. *bolli*; Ger. *bulle*, a

bull: Icel. *baula;* Swiss, *bullen,* to bellow (see BELL)]: the animal which bellows; the male of the ox kind (see Ox); in *Scrip.,* a fierce and powerful enemy; a stock-jobber on the stock exchange who endeavors to raise the price of stocks by questionable practices — those who try to lower their price are called *bears.* BULL'ISH, *-ĭsh.* BULL-HEADED, BULL-LIKE, a. pertaining to a bull; dogged and self-willed. BULL-BAITING, n. the rendering bulls furious by setting dogs to attack them. BULL-DOG, n. a large-headed, strong-jawed variety of dog. BULL-DOGS, in *familiar slang,* attendants on the proctors, in their official duties, in Oxford. BULL'DOZE, v. to intimidate, especially in political elections. BULL-FACED, a. having a large heavy face, as it were like a bull's face. BULL-FIGHT, n. an amusement among the Spanish and Portuguese, consisting of an exhibition of men fighting with wild bulls. BULL-FLY, n. a gadfly. BULL-FROG, a large species of American frog, uttering a loud croak or bellowing noise. BULL-HEAD, a small sea-fish. BULLOCK, n. *bûl'ŏk* [AS. *bulluca*]: an ox or castrated bull fed for slaughter, so named after he is four years old—named a *bull-calf* for first year, and a *steer* up to fourth year. BULL-CALF, a male calf; a young stupid fellow. JOHN BULL, a familiar name for the personification of Englishmen, from their supposed sturdy assertiveness and pugnacious propensities mingled with honesty and dogmatism—so named by Arbuthnot in a ludicrous *jeu d'esprit,* 1712. BULL'S-EYE, n. *bûlz-ī,* among *seamen,* a small pulley, of wood, shaped like a ring, with a rope spliced around the outer edge, and another rope running through it; a thick piece of glass inserted in a floor, a lantern, etc.; a dark distant cloud, ruddy in the centre, foretelling a storm; the centre mark on a target for shooting at; a small round window or opening.

BULL, n. *bûl,* in IRISH-BULL [Gael. *beul-aithris*—pronounced *bûl-ār'ĭsh*—an oral tradition having no foundation but talk—from *beul,* mouth; *aithris,* a tradition]: a peculiar form of blundering in telling a story, in a joke or in a remark, credited as being very prevalent among the Irish people.

BULL, n. *bûl* [It. *bolla,* a circular mark or seal—from L. *bulla,* a bubble, a boss or ornament]: originally the capsule of the seal appended to letters from emperors or from the pope. Afterward, the word was applied to the seal, and then to the document itself, as the celebrated Golden Bull of the Emperor Charles IV., of Germany, 1356, fixing the laws relative to the election of emperors, and as the similar edict, of the same name, by Andrew II., of Hungary—named from the golden capsule appended to imperial letters and other important documents by the Byzantine and Frank emperors as early as the 9th c. The name is now applied exclusively to letters or documents issued in the name

of the pope. Bulls are issued by the apostolic chancellor, and are dated 'from the day of incarnation,' whereas briefs are always dated 'from the day of the nativity.' See BRIEF. In cases of granting favors, etc., the seal is appended to the open letter by a yellow or red band of silk; but in the administration of justice, a gray hempen band is used. All bulls, excepting those addressed to the United Greek Christians, are written in Latin with Gothic letters, and on the rough side of the parchment. All bear the name and title of the pope—for example, *Gregorius Episcopus Servus Servorum Dei*, etc., is prefixed; then follows a general introduction, of which the initial words are used to give a distinct name to the bull, as in the examples: the Bull *Exsurge Domine*, issued by Pope Leo X. against Luther, 1520; the Bull *In Cœna Domini*, the celebrated Bull against heretics, often reissued since 1536; the famous *Unigenitus*, or Bull against Kuesnel's writings, 1713; the *Dominus ac Redemptor Noster*, or Bull for the abolition of the order of Jesuits; the *Ecclesia Christi*, or the Bull which completed the *concordat* with France, 1801; the *De Salute Animarum*, or the Bull for the regulation of the Rom. Cath. Church in Prussia. To every Bull the leaden seal of the Church is appended, bearing on the obverse the arms of the pope, and on the reverse his name. Bulls issued during the interim between the election and consecration of a pope have no armorial bearings on the seal. A *bullarium* or *bullary*, is a collection of papal bulls, as the *Bullarium Magnum Romanum a Leone Magnoad Benedictum XIII.* (19 vols., Luxembourg, 1727–58), the *Bull Romanum* (28 vols., Rome, 1737–44), and the *Bull Benedicti XIV.* (Mechlin, 1826–7), and more recently, the continuation of the *Bullarium Romanum Magnum* by Barberini (Vienna, 1835).

BULL AND COW, the names given by English-speaking races from time immemorial to the male and female respectively of the bovine cattle. The words are probably imitative, the root-idea of 'bull' being a suggestion of its bellowing; while 'cow'—which in nearly English, as yet in Scotch and some provincial dialects, is pronounced *coo*—is imitative of the lowing call to the calf. Since these animals have become domesticated, and most of the males been castrated, the term has come to mean more particularly an unmutilated ox. On the other hand, the large size and robust qualities of the bull have led to a transference of the term to the males of various other animals having no zoological resemblance, or very little, to the cattle. Thus we speak of 'bull and cow' elephants, moose, wapiti, seals, whales, and even alligators; while various animals, as the bullsnake, take the name as expressive of some bull-like quality.

BULL, Charles Stedman, American physician. He was graduated from Columbia College in 1864, and at the College of Physicians and Surgeons in 1868. He is surgeon to the New York Eye and Ear Infirmary, consulting ophthalmic surgeon to St. Luke's and Presbyterian hospitals, and St. Mary's Hospital for Children. He is professor of ophthalmology in Cornell University. He has written: *Eye Defects Which May Cause Apparent Mental Dulness and Deficiency in Children* (1901); *Tuberculosis of the Eye* (1900); both in the *Transactions* of the New York Academy of Medicine; *Vascular Tumors of the Orbit* (1900), and other articles on his specialty in the *Transactions* of the American Ophthalmological Society, the *Medical News* and *Medical Record.*

BULL, George, D.D., Bishop of St. David's: 1634, Mar. 25—1709, Feb. 17; b. Wells, Gloucestershire, Eng. He studied at Oxford, whence he retired, 1649, having refused to take the commonwealth oath imposed by the parliament. Receiving holy orders, his first charge was the parish of St. George's, Bristol. In 1658 he obtained the rectory of Suddington St. Mary's, near that city; and in 1662 was presented to the vicarage of Suddington St. Peter's. In 1669 he published his *Harmonia Apostolica,* the object of which was to reconcile the apostles Paul and James on the subject of justification. This work occasioned considerable controversy among divines, and in answer, Bull published his *Examen Censuræ,* and *Apologia pro Harmonia.* In 1678 he was presented to a prebend in Gloucester Cathedral, and made rector of Avening, Gloucestershire. In 1679 he was installed archdeacon of Llandaff, and received the degree of D.D. from Oxford. In 1685 he published his *Defensio Fidei Nicenæ,* against the Arians and Socinians, Tritheists and Sabellians; and in 1694 *Judicium Ecclesiæ Catholicæ.* His last work was his *Primitive and Apostolical Tradition,* etc. He was consecrated Bishop of St. Davids, 1705.

BULL, George Joseph, Canadian ophthalmic surgeon: b. Hamilton, Ontario, 1848, Feb. 16. He was graduated at McGill University in 1869, studied in Paris, and began the practice of medicine in Montreal, devoting himself especially to diseases of the eye. He made his residence in Paris in 1886, and has won celebrity as an expert in ophthalmic subjects. He has written *Ophthalmia and Optometry.*

BULL, John, English musician: b. Somersetshire, about 1563; d. Antwerp, 1628, March 12. He was appointed organist in the Queen's Chapel in 1591; first music lecturer at Gresham College in 1596; and organist to James I. in 1607. A Catholic, he fled beyond the seas in 1613, and at Brussels entered the archduke's service. In 1617 he became organist at Antwerp cathedral. The claim advanced for his authorship of *God Save the King* is unfounded.

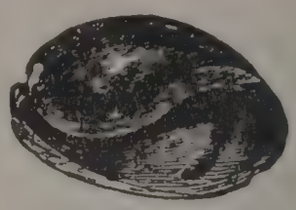
BULL, GOLDEN: see BULL.

BULL, JOHN, MUS. DOC.: 1563–1628; b. Somersetshire, England: eminent English musician. He studied music under Blitheman, organist in Queen Elizabeth's chapel. He was made Doctor of Music at Oxford, 1592, having in the previous year become organist in the Queen's Chapel, and soon afterward he was appointed prof. of music in Gresham College. He visited the continent, 1601; and again, 1613. In 1617 he was appointed organist of Notre Dame at Antwerp, where he died. The composition of the English national anthem has been attributed to him, but on insufficient evidence.

BULL, OLE BORNEMANN: 1810, Feb. 5—1880, Aug. 18; b. Bergen, Norway: famous violinist. His father, it is said, attempted to coerce him into the study of theology, and would not permit a musical instrument about the house, which treatment only gave a more decisive character to the peculiar genius of the boy. At the age of 18 he was placed at the Univ. of Christiania, from which he is said to have been expelled for taking temporary charge of the orchestra at one of the theatres. In 1829 he went to Casel, Germany, to study under Spohr, but was so coldly received that he betook himself to the study of law at Göttingen. He was subsequently at Minden, whence, in consequence of a duel, he fled to Paris, 1831. An unsuccessful attempt to drown himself in the Seine was the turning-point in his life. He thereafter acquired the patronage of a lady of rank, and rapidly rose to fame as a violinist. His style of playing was like that of Paganini. B., however, wished to excel his model in originality, and in triumphing over the most extraordinary difficulties; but it was impossible for him to follow the flight of the great Italian, in whose brain some capricious musical demon seemed to lurk. Nevertheless, he was received in Italy with prodigious enthusiasm—Malibran herself embracing him on the stage at Naples. In 1836, he visited England, Scotland, and Ireland, and subsequently travelled in a professional capacity through Belgium, Holland, Russia, and Germany. After a long repose, he sailed for America, whence he returned, 1850; but he again went out on the stage, and was so successful that he thought of retiring from public life. He purchased in Pennsylvania 125,000 acres of excellent ground, and founded a colony of Scandinavians. This turned out a complete failure through the worthlessness of the title to the lands, and B. fell back on his violin. He returned with a fortune to the United States, 1869, making his home in Cambridge, Mass.; but visited Europe again, 1875. He married in 1870 a young lady from Wisconsin. He died near Bergen, where he had a summer residence. See his Life, by Sara C. Bull (1883).

BUL'LA: genus of *Mollusca*, which in the older systems founded upon characters taken from the shell alone, contained a heterogeneous assemblage of species essentially very different. Some of those having been removed to

other orders according to their organization, the genus *Bulla*, and the family *Bullidæ*, of which it is the type, are placed in the order *Tectibranchiata* of Cuvier, an order of the class *Gasteropoda* (q. v.), and of that section of it called *Monœcia*, having the male and female organs of sex combined in the same individual. The *Bullidæ* have a convoluted and generally thin shell, which serves as a covering and protection for the gills, and which in some of them is large enough to form a retreat for the entire animal, in others, is itself enveloped in the mantle. This shell forms a sort of transition link between the flat calcareous plate inclosed in the mantles of the *Aplysiæ* or Sea-hares—to which B. is nearly allied—and the spiral shell of snails and other such conchiferous mollusks. The mouth of the shell is large, extending the whole length of the shell, widening toward one end, the lip acute. The gizzard of the *Bullidæ* is very muscular; and among its thick coats, in many species, are found calcareous bony plates, which being moved against each other by its muscles, serve to grind down the food. All the species are marine; some are found on the British coast.



Bulla Aperta.

BULLA, n. *bŭl'lă*, BULLÆ, n. plu. *-lē* [L. *bulla*, a water-bubble]: the blisters or large vesicles on the body in some forms of skin disease; blebs; in *anat.*, a hollow rounded shell of bone. BULLOUS, a. *bŭl'lŭs*, pertaining to bullæ. Bullæ, as collections of serous fluids of considerable size, are situated immediately beneath the cuticle, and rising from the true skin. They differ from vesicles only in size; and no very definite line can be drawn between a large vesicle and a small bulla. They usually vary in diameter from a quarter of an inch to two inches. They may be followed by crusts or by ulcerations. They constitute a special order of skin-diseases, which includes Pemphigus and Rupia (q. v.).

BULLACE, n. *bûl'lās* [Gael. *bulaistear*, a sloe: Ir. *bulos*, a prune: OF. *bellocier*, a wild plum-tree], (*Prunus insititia*): shrub or small tree, larger and much less spiny than the sloe, but very closely allied to it, as also to the plum, so that many botanists regard them all as one species, an opinion favored by the fact that the varieties pass into each other by imperceptible gradations. The B. may be regarded as a form intermediate between the plum and the sloe. Its leaves, however, are generally broader in proportion to their length than those of either of these, and its fruit-stalks more frequently in pairs; it differs also from both of them in its downy fruit-stalks, and in having the under side of its leaves permanently downy. The flowers are rather larger than even those of the plum; the fruit is larger than the sloe, generally globose, and, though it partakes in some degree both of the acidity and the roughness of the sloe, it is not

unpleasant, especially after having been mellowed by frosts and makes excellent pies or tarts. 'A bullace-pie is a standing dish at the harvest-home supper in the south of England. The B. is common in hedges, coppices, and banks in many parts of Europe.

BULLAS, *bôl'yâs:* town of Spain, province of Murcia, 26 m. w.n.w. of the town of Murcia. It is on a hill, 1,840 ft. above the sea. The streets are steep and unpaved. B. has manufactures of linen and hempen fabrics, earthenware, and brandy, and a considerable trade in manufactured goods and grain. Pop. 6,145.

BULLATE, a. *bûl'āt* [L. *bulla*, a bubble]: in *bot.*, garnished with studs like bubbles or blisters.

BULL'-BAITING: a barbarous sport, formerly popular in England with all classes of society. B., practiced at Stamford, 1209, at Tutbury 1374, was declared illegal by act of parliament 1835. It consisted in causing a bull to be attacked by dogs; and in order that the bull might be made as furious as possible, his nose was sometimes blown full of beaten pepper before he was turned loose. Another form of this sport was to fasten the bull to a stake, by a rope of some yards long, and to send bull-dogs against him, one at a time, which were trained to seize him by the nose, and when this was accomplished, it was called *pinning* the bull. But no small part of the enjoyment of the spectators was derived from the success with which the attacks of the dogs were met by the bull lowering his head to the ground, and receiving them on his horns, often tossing them to a great distance. In some places B. took place regularly as a sort of annual festival, and funds were sometimes left to provide for it. King James I. of England greatly delighted in this sport. When the late Emperor Nicholas of Russia visited England, before his accession to the empire, he was present at a boxing-match and a B., which were provided to show him English tastes.

An equally barbarous sport, termed *Bull-running,* was formerly practiced at Stamford and Tutbury, where men and women took the place of dogs, maddened the bull with hideous noise, and then pursued it with 'bull-clubs,' till the unfortunate animal expired beneath the blows of its brutal assailants.

BULL'-DOG: a kind of dog regarded as peculiarly English, but concerning which there is doubt whether it has existed as a distinct race, at least from the Roman era, or has more recently sprung up, as a variety of the mastiff, or a cross between the mastiff and some other breed. Buffon, indeed, represents the B. as the parent race, and the mastiff as derived from it, but this opinion is generally rejected. The B. has been regarded as a distinct species by some naturalists, and named *Canis Anglicus, C. laniarius,* etc. It is much smaller than the mastiff, but is very strong and muscular. The breadth of muzzle is greater than in the mastiff, and the head is very large, almost appearing as of disproportionate size to the body. 'The forehead sinks between the eyes, and the line of the nose rises again at a

considerable angle; the lower jaw projects beyond the upper, often showing the teeth, which altogether, with the frequent redness about the eyelids, produces a most forbidding aspect; the ears are partially drooping, unless the terrier blood is crossed in the animal, and the tail is carried high.' The hair is short, and the tail taper, and not bushy. The color may be ochry or reddish buff, brindled, fawn, or white, the last being preferred, and should be whole or unmixed, though dogs of two colors are very common. The B. used seldom to be seen except in company of persons who delight in dog-fighting and other barbarous sports, but now has sometimes more reputable patrons. It was formerly much employed in bull-baiting, from which it derives its name. It is remarkable chiefly for its savage ferocity

Bull-dog.

and the pertinacity with which it retains its hold, as if its jaws were locked, and it could not let go. It will hang to the jaw or nose of a bull, although lifted from the ground. Colonel Hamilton Smith says he has seen one 'pinning an American bison, and holding his nose down, till the animal gradually brought forward its hind feet, and, crushing the dog to death, tore his muzzle out of the fangs, most dreadfully mangled.' The B. is also bold enough to attack any animal, however superior in size and strength.

The BULL-TERRIER is a cross between the B. and the terrier. It is smaller than the B., more lively and docile, and equally courageous. The ears are always pointed; the best color is white, with some black about the head. It is unrivalled in rat-catching.

BULLER, *bûl'ler*, CHARLES: 1806-48; b. Calcutta. He was educated at Harrow and Cambridge, at both of which he distinguished himself, and for a time studied in Edinburgh, where he had Thomas Carlyle for one of his tutors. He was called to the English bar, 1830, and entering parliament before the reform bill, continued a member of the lower house till his death. He was amiable and socially accom-

plished, and many hopes were disappointed when he died. In politics, a philosophical radical, he occupied successively the posts of judge-advocate-gen. and pres. of the poor-law commission under whig governments.

BULLER, Sir Redvers Henry: Brit. military officer; b. 1839 in Devonshire, Eng.; entered the Brit. army 1858; served in campaigns in China 1860; Red River Exped. 1870; Ashanti war 1873-74; Kaffir war 1878; Zulu war 1878-79; and in campaigns in Egypt 1882-84 and Sudan 1884-85. He was made dep. adj.-gen. 1885; under sec. for Ireland 1887; adj.-gen. 1890; lieut.-gen. 1891. At the outbreak of the British-Boer war in S. Africa, 1899, he was placed in command of the Brit. forces who went to the relief of Ladysmith. In attempting to force the passage of the Tugela R. at Colenso, he was repulsed with a loss of 1,097 officers and men and 11 guns, but after several repulses succeeded in relieving the city, 1900, March 3.

BULLET, n. *bûl'lĕt* [F. *boulet*—From F. *boule* or *bulle*, a ball, a bubble—from L. *bulla*, a bubble, a round knob]: the leaden projectile discharged from a musket, fowling-piece, pistol, or similar weapon. When the smooth-bore muskets alone were used, bullets were made by casting. Molten lead was poured into molds; and the molds were dipped in cold water, to hasten the solidification of the lead. The molds were cooled after every few times of using; and the lead was heated only to the degree for maintaining fluidity. Bullets are now made more expeditiously, and more truly spherical in form, by compressing machines. The lead is first fashioned into a rod about a yard long, by five or six eighths of an inch thick; this rod is passed between rollers to condense it; then between other rollers to press it into a row of nearly globular pieces; then a spherical die gives the proper form to each of these pieces; and, lastly, a treadle-worked punch separates them into bullets. With one machine and two dies, 9 boys can make 40,000 bullets a day.

Spherical bullets for the old muskets, carbines, and pistols varied from 14 to 20 to the pound, and from 0.60 to 0.68 of an inch in diameter. There is a particular ratio, depending on the specific gravity of lead, by which the number to the pound will give the diameter, or *vice versâ*. Such bullets are being superseded by other forms better suited for rifles. These forms are numerous. Robins's B. was egg-shaped, with the centre of gravity at the larger end; Beaufoy's was ovoid, with a hemispherical cavity at one end; Manton's was a spherical ball put in a wooden cup, with projections on the exterior; Greener's was oval, with a plug of mixed metal driven into a hole barely large enough for it; Norton's, Delvigne's, Minié's and others, are, or were, of various elongated shapes, mostly with some kind of plug, which, driven into the lead by the force of the explosion, causes it to fill up the grooves in the rifling of the barrel. The bullets for the Enfield

rifles are now made with extraordinary speed, by machinery of beautiful construction. The machine draws in a coil of leaden rod, unwinds it, cuts it to the required length, stamps out the bullets with steel dies, drops them into boxes, and conveys them away. Each machine, with its four dies, makes 7,000 bullets per hour; and four such machines, in an easy day's work, turn out 300,000 bullets. So nearly are the machines automatic, that one man can attend them all. Other machines, attended by children, produce an equal number of little boxwood plugs for filling the cavity at the hinder end of the bullet. For the differences between various bullets of modern invention, see CARTRIDGE: BREECH-LOADING.

BULLETIN, n. *bûl'lĕ-tĭn* [F. a packet—from It. *bullettino*—from *bulla*, an edict of the pope]: an official report or notice; a public announcement, as a dispatch from a general, a report of the health of distinguished personages; also, brief authenticated documents as of scientific societies; and in France, the slip of paper on which an elector writes his vote.

BULLET-TREE, or BULLY-TREE: a tree in Guiana valued for its wood, which is solid, heavy, close-grained, and durable; also for its fruit, which is a drupe about the size of a cherry, and of delicious taste. The B. is supposed to belong to the genus *Mimusops* (nat. ord. *Sapotaceæ*, q.v.).

BULL-FIGHT: combat of men with bulls for the entertainment of the public. They were common in Greece, particularly in Thessaly, and in Rome under the emperors, though in later times forbidden by emperors and popes. They are still a favorite pastime in Spain and Mexico. In Spain they were abolished by Charles IV.; but Joseph, Napoleon's brother, re-established them, out of policy, the mass of the Spanish population being passionately fond of the sport. The most magnificent bull-fights were at one time instituted by the monarchs themselves; at present, both in the capital and in the larger towns of Spain, they are held either as private speculations, or for the benefit of public institutions. In Madrid, the bull-fighting season commences in April, and lasts until November. During that time, there is at least one afternoon in every week devoted to the sport. The proceeds go to the funds of the general hospital. The fights take place in a kind of circus, called the *Plaza de Toros*, round which the seats rise one above another, like the steps of a stair, with a tier of boxes over them. The *Plaza* is capable of containing from 10,000 to 12,000 people, who pay a high price of admission, considering the rate of wages in Spain; and all go attired in their best to the spectacle. The best Andalusian bulls are bred at Utrera, the best Castilian ones on the Jarama, near Aranjuez. The latter are the breed usually chosen for fight in Madrid. They are fiercer and more active, but inferior in strength to British animals. The horses engaged in the conflicts are worthless brutes, fit only for the knacker. The men employed in the fight are generally those who have been

bred to it as a profession, but occasionally amateurs may take part in it. The B. has been described as a tragedy in three acts. The principal performers in the first are the *picadores;* in the second, the *chulos* are the only actors; the third and last act devolves solely on the *matador*. The *picadores* are all mounted, dressed like Spanish knights of the olden time, and armed with a lance; they take up their position in the middle of the circus, opposite the bull-stalls. The *chulos*, who are on foot, are gay with ribbons, and wear very bright-colored cloaks; they distribute themselves in the space between the barriers. The *matador*, or chief combatant, is also on foot. He is handsomely dressed, and holds in the right hand a naked sword, in the left the *muleta*, a small stick, with a piece of scarlet-colored silk attached. On a sign given by the chief magistrate, a bull is let out from the stalls; the *picadores* stand ready in the arena waiting his charge. With a brave bull they find all their skill requisite in acting on the defensive; with a cowardly one they act on the offensive; and should their stabs be ineffectual in rousing the animal to the requisite fury, the poor beast is hooted by the crowd, and ultimately stabbed ingloriously in the spine. Whenever a horse is wounded, the rider betakes himself to flight; and when either the above casualty happens, or a *picador* is thrown the *chulos* rush in, and attract the bull by their cloaks, saving themselves, if need be, by leaping over the palisade which incloses the circus. At the same time another *picador* calls off the bull's attention to himself by shouting. When the bull begins to flag, the *picadores* are succeeded by the *chulos*, who bring with them the *banderillas*—i. e., barbed darts about two ft. long, ornamented with colored paper-flags, which they stick into the neck of the animal. Sometimes these darts have crackers attached to them, the explosion of which makes the bull furious. The *matador* now enters alone to complete the tragic business. As soon as the bull's eye catches the *muleta*, he generally rushes blindly at it; and then the *matador*, if he is well skilled, dexterously plunges the sword 'between the left shoulder and the blade,' and the animal drops dead at his feet. The victorious *matador* is greeted with acclamations, and not less so the bull, should he wound or even kill the *matador*, in which case another *matador* steps forth into the arena; but human life is rarely sacrificed. Eight or ten bulls are often dispatched in a single day; twenty minutes being about the time usually taken to slay one.

In Madrid, 1833, June, 99 bulls were killed in a week. Bull-fighters are regarded as the lowest class in Spain. They are very ignorant and superstitious; and those who are killed on the spot, and die without confession, are denied burial rites.

BULL-FINCH, n. *bûl'finsh* [corruption of *bud*-finch, as causing destruction among buds], (*Pyrrhula vulgaris*): bird of the great family of *Fringillidæ* (q.v.) a little larger than the common linnet, and of a genus closely allied to the Grosbeaks and Crossbills. The genus is particularly characterized by the short, thick, rounded bill, of which

the sides are inflated and bulging, and the tip of the upper mandible overhangs that of the lower one. The B. is a bird of very soft and dense plumage, of a delicate bluish-gray color above, the under parts of a bright tile-red, the crown of the head and the beak jet black, which color also appears in the greater wing and tail coverts, in the quills, and in the tail-feathers; the wings are crossed by a conspicuous white bar. The colors of the female are less bright than those of the male. The tail of the B. is almost even. This bird is not unfrequent in England, Ireland, and the s. of Scotland; and is found in most parts of Europe, from the s. of Norway to the Mediterranean, extending e. throughout Asia, even to Japan. It frequents woods and gardens, builds its nest in trees or bushes a few

Bull-finch.

feet from the ground, feeds chiefly on seeds and berries in winter, and in spring is excessively destructive to the buds of fruit-trees in some places, selecting the flower-buds, apparently finding them the most palatable of all food. Selby says: 'I have known a pair of these birds to strip a considerable sized plum-tree of every bud in the space of two days.' On this account, gardeners are sometimes compelled to wage war against the bull finch.

The song of this bird, in a wild state, is very simple, and has no particular quality to recommend it; but it is remarkably susceptible of improvement by education; and trained bull-finches of superior requirements are sold at a considerable price. Some of these birds learn to whistle an air very accurately, and with a power and variety of intonation far exceeding their natural song. The ability to whistle several airs well is rare. The training of these birds is a work both of time and trouble: it is done chiefly in Germany. Not less than nine months of training are requisite: it begins when the bird is a mere nestling, and must be carefully continued till after the first moulting;

for it is remarkable that all previously acquired is liable to be lost at that time, or is afterward so imperfectly remembered that the bird is of little value. The B. is capable of very strong attachment to those who feed and caress it, and often becomes so thoroughly domesticated as to exhibit no desire for liberty.—Curious variations of plumage are sometimes observed in it.—Other species of the genus *Pyrrhula* are known, natives of different parts of the world; and in this genus some ornithologists include *Corythus* of Cuvier, of which one species, the Pine-finch (q.v.), or Pine Grosbeak, is a native of Britain.

BULL'-FROG (*Rana pipiens*): species of frog (q.v.) found in most parts of the United States and Canada, but chiefly in the southern states. It is of large size, eight to twelve inches long, of an olive-green color, clouded with black. It receives its name from the remarkable loudness of its voice, which has been compared to the bellowing of a distant bull, and comes in as a hollow bass in the frog concerts which at certain seasons are commonly heard in the evening and all night long in marshy places in America. Its voice can be distinctly heard at a distance of forty or fifty yards. It sits for hours during the day, basking in the sun, near the margin of a stream, into which it plunges with a great leap on the least appearance of danger. It does not confine itself to insect and molluscous food, like smaller frogs, but is said to be partial to young ducks, and to swallow them entire. Audubon says 'its flesh is tender, white, and affords excellent eating,' the hind legs, however, being the only part used for food. He adds that these parts make excellent bait for the larger cat-fish, and that he has generally used the gun for procuring them, loading with very small shot.

BULL'HEAD, or River Bullhead, or Miller's Thumb (*Cottus Gobio*): small fish, abundant in clear rivers and streams, in some parts of the British Islands, throughout the greater part of Europe, and in the n. of Asia. It seldom exceeds four or five inches in length; is of a dark brown color on the upper parts, and white beneath; has rather large fins, with rays slightly produced into spines and spotted; and in general appearance is not unlike the gurnards (q. v.). It is generally regarded as a disagreeable object, on account of the great size and depressed form of its head, from which it derives its English names; the name, Miller's Thumb, alluding to the broad rounded form which the last joint of the thumb of a miller used to acquire when machinery was rude, by its continual employment in testing the quality of the flour produced. The appearance of the B. is still more unattractive from the entire absence of scales, a characteristic of the genus to which it belongs, the whole body and head being covered with a soft skin. Yet it is said to be of delicate flavor, and in some countries is sought as food. Its flesh, when boiled, is reddish, like that of the salmon. Izaak Walton speaks of angling for the B., and in his pleasant quaint style describes the habits of the fish: 'He does

usually dwell and hide himself in holes, or amongst stones in clear water, and in very hot days will lie a long time very still, and sun himself, and will be easy to be seen upon any flat stone, or any gravel, at which time he will suffer an angler to put a hook baited with a small worm very near into his mouth, and he never refuses to bite, nor indeed to be caught, with the worst of anglers.'—The other British species of the genus *Cottus* (q.v.) are marine. The name B. is not usually given to any of them. A sea-fish of a

Bullhead.

nearly allied genus (*Aspidophorus*) is sometimes called the ARMED BULLHEAD; it is also known as the POGGE (q. v.).—The River B. differs from the marine species of the same genus, in having only one short spine on each side of the head, on the *preoperculum*.—In America B. is the usual name for several species of small voracious marine and river fish of this genus and of an allied genus. The Sculpin is the popular name for one of the most disagreeable of these species; it is not sought for the table.

BULLINGER, *bûl'ĭng-ẽr*, HENRY: 1504, July 18—1575, Sep. 17; b. Bremgarten, canton of Aargau: friend of Zwingli, and one of the chief reformers in Switzerland. He studied at Cologne, where he became acquainted with the writings of Luther; and during 1527 he attended the theological expositions of Zwingli, and went with him to the religious conference at Bern 1528, the result of which was the reformation of the canton. In 1529, he married Anna Adlischwyler, formerly a nun, who bore him eleven children. By a powerful sermon which he preached at Bremgarten, 1529, on Whitsunday, B. induced his whole congregation to make a profession of Protestantism. In 1531, he was compelled by the Rom. Cath. party to flee from the canton, and went to Zurich, where, in the following year, he was appointed pastor of the principal church. In the controversy on the eucharist and the affairs of the Anabaptists, B. distinguishes himself by integrity and moderation; and in his house at Zurich several German theologians, compelled to leave their country, were hospitably sheltered. He took part in drawing up the first Helvetic Confession at Basel, 1536, and in establishing a close relation between the Swiss and Anglican Churches. His writings are numerous. The most important is a *History of the Reformation*, pub. first at Zurich, 1838. His sermons have been translated into English. See the lives of B. by Hess (1828) and Christoffel (1875).

OCT 21 1911

One copy del. to Cat. Div.
OCT 21 1911

LIBRARY OF CONGRESS
0 033 261 272 4